LONDON-WEST MIDLANDS ENVIRONMENTAL STATEMENT

Volume 5 | Technical Appendices

Transport Assessment (TR-001-000)

Part 8: West Midlands assessment

Traffic and transport

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Department for Transport

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High Speed Two (HS2) Limited,
Eland House,
Bressenden Place,
London SW1E 5DU

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8.1 Introduction and scheme description

8.1.1 This section of the TA outlines the regional assessment undertaken for the Proposed Scheme within the West Midlands metropolitan area between Balsall Common and Hampton-in-Arden (CFA23) and Washwood Heath to Curzon Street (CFA26). Key features in this region are:

- CFA23 – Balsall Common and Hampton-in-Arden; above ground alignment approaching Birmingham Interchange station;
- CFA24 – Birmingham Interchange and Chelmsley Wood: includes Birmingham Interchange station, M42 crossing and above ground alignment;
- CFA25 – Castle Bromwich and Bromford: mostly in tunnel; and
- CFA26 – Washwood Heath to Curzon Street: includes Washwood Heath maintenance depot and Curzon Street station.

8.1.2 Assessment has been carried out for construction impacts on the West Midlands transport network, assessed in future year (2021), with outcomes reported by CFA, along the proposed line of route from Balsall Common to Birmingham city centre (Curzon Street station).

8.1.3 Operation assessment has been undertaken for two operational years – opening year (2026) and scheme plus 15 years (2041). Impacts on the public transport and highway networks have been assessed, using local highway models (BIM and BCCM) in the Birmingham Interchange (CFA24) and Curzon Street station (CFA26) areas to identify highway impacts, where the majority of impacts in operation are expected together with the Washwood Heath maintenance depot (CFA26).

8.1.4 The remainder of this sub-section considers the assessment methodology and assumptions specific to this region. Where there are particular assumptions or methodology related to individual CFAs then these are considered within the individual CFA sub-section.

8.2 Regional methodology and assumptions

Introduction

8.2.2 This section describes the methodology and assumptions adopted in the West Midlands where they differ from those already described in the route-wide methodology and assumptions chapter or require more detailed information. Assumptions that relate to specific CFAs are considered in the individual CFA sub-sections

8.2.3 This sub-section considers:

- stakeholder engagement;
- West Midlands Modelling Framework;
- regional Modelling;
- sub-Regional Modelling;
- PLANET model outputs;
- local assessment – junction modelling; and
- public transport impacts.

Stakeholder engagement

8.2.4 A number of stakeholder organisations were consulted during the development of the methodology adopted for the West Midlands. A particular focus was the local authorities and others directly affected by the Proposed Scheme. Consequently, Birmingham City Council (BCC), Solihull Metropolitan Borough Council (SMBC), CENTRO and the Highways Agency (HA) were consulted on the TA scope and methodology and on-going discussions were held to ensure issues raised by the authorities were fully considered.

8.2.5 Engagement also included the seven local authorities within the West Midlands that own the regional transport model PRISM with CENTRO and the HA. The seven local authorities include Birmingham City Council (BCC), Solihull Metropolitan Borough Council Wolverhampton City Council (WCC), Dudley Metropolitan Borough Council (DMBC), Coventry City Council (CCC), Sandwell Metropolitan Borough Council (SMBC) and Walsall Metropolitan Borough Council (WMBC). Liaison with the joint owners was undertaken through the PMG (PRISM Management Group), which also included the transport consultant (Mott Macdonald) responsible for developing the PRISM model on behalf of its owners. Warwickshire County Council (WCC) was also consulted.

8.2.6 Through these meetings, discussions and technical reviews, the methodology for the West Midlands outlined below was agreed with all parties as the most appropriate approach to assess the impacts of the Proposed Scheme within the West Midlands for the TA.

Modelling framework

Approach

8.2.7 The impact of the Proposed Scheme through the West Midlands, specifically as a result of the new Curzon Street and Birmingham Interchange stations, was assessed through a combination of strategic and local modelling exercises, supplemented with data from other sources (most notably, the PFM Model, local transport authorities, the DfT, the HA and HS2 Ltd's own data collection programme).

8.2.8 The purpose of all of the modelling and assessment work was to ensure that the impacts of the construction and operation of the Proposed Scheme were duly considered, inclusive of:

- providing substantive analysis for the TA;
- establishing the likely impact and possible traffic and transport mitigation required;
- supporting the EIA process including the provision of traffic data to inform other assessments;
- informing the engineering design of the Proposed Scheme for both the construction and operational phases of the project; and
- informing engagement with planning authorities and other stakeholders throughout the development of and the passage of the HS2 hybrid Bill.

8.2.9 The modelling and assessment work undertaken for the West Midlands is robust because it:

- was undertaken respecting applicable guidance;
- used appropriate and suitably robust tools, taking the full variety of demand generation and responses into account as appropriate;
- was subject to appropriate quality assurance checks; and
- used an objective methodology to reach conclusions.

8.2.10 Where detailed modelling has been undertaken, it has used appropriately enhanced and updated versions of existing models, almost all of which are owned by affected stakeholders and were used and/or updated and enhanced in cooperation with them.

Framework

8.2.11 An overview of the modelling framework for the West Midlands is shown in Figure 8-1, it can be summarised as:

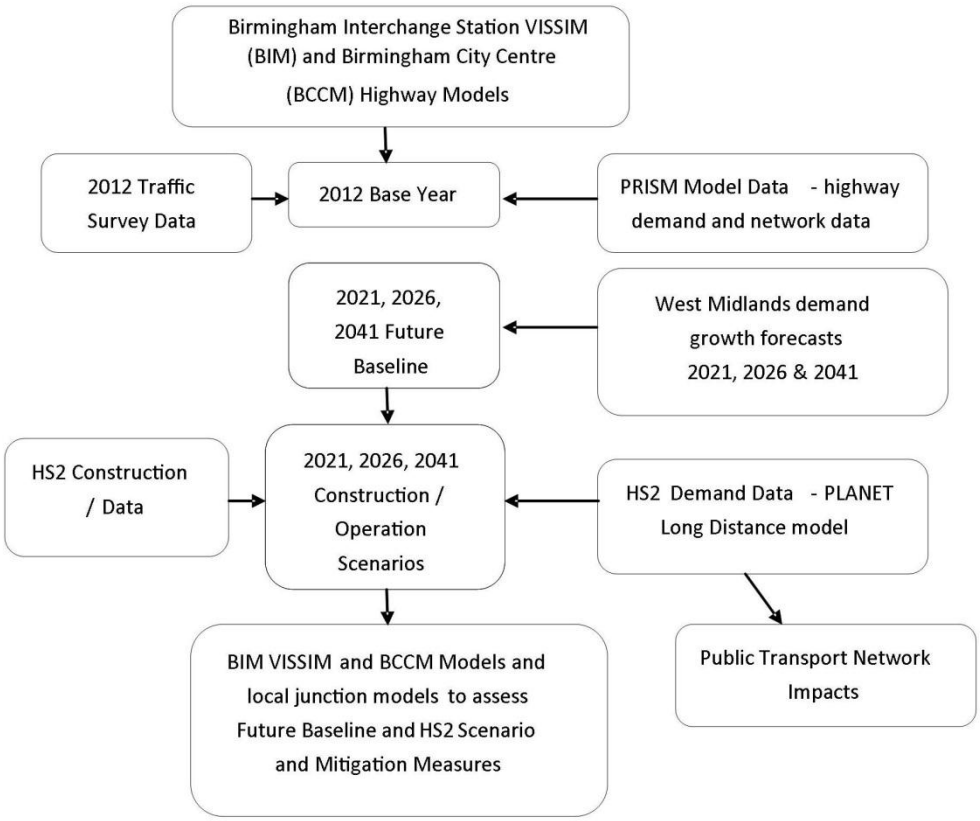
- strategic long distance rail demand modelling;
  - the PLANET Framework of Models (PFM), including PLANET Long Distance (PLD), PLANET Midland (PM), PLANET South (PS) and the PLANET Station Choice Model (SCM);
- regional multi-modal transport modelling;
  - the West Midlands Authorities' and HA's PRISM (Policy Responsive Integrated Strategy Model) model;
- highway assignment modelling;

  - Birmingham City Centre SATURN model (BCCM) and Birmingham Interchange SATURN and VISSIM models (BIM SATURN and BIM VISSIM);
- local junction modelling as required; and
- public transport analysis, based on outputs from the PLANET models.

8.2.12 The modelling framework outlined in Figure 8-1 Illustrates how the PRISM model provided inputs to the BCCM and BIM SATURN models. More specifically, cordoned versions of the PRISM base models were used to develop the network and matrices for the BCCM and BIM SATURN models, whilst forecast year demand growth for both the BIM and BCCM SATURN models was informed by current PRISM sub-models and datasets.

8.2.13 A base year of 2012 was developed and validated for each model. Validation was undertaken against 2012 traffic data. Traffic generation and distribution assumptions from the scheme construction teams were used to develop future year Proposed Scheme construction scenarios. Operational scenario trip generation and distribution assumptions used in the BIM and BCCM SATURN modelling were obtained from PLANET. The analysis of the impact on the public transport network was also based on PLANET outputs.

Figure 8-1: West Midlands metropolitan area modelling framework



8.2.14 PRISM and PLANET outputs were appropriately interpolated or extrapolated where necessary to reflect the cited forecast years.

Regional modelling

8.2.15 PRISM is a strategic regional model of the West Midlands' highway and public transport networks developed by Mott MacDonald and RAND Europe, funded and owned by the seven district authorities of the West Midlands, CENTRO and the Highways Agency. It models the following travel responses to congestion, investment and policy:

- changes in trip making;
- changes in trip destinations;
- changes in mode choice; and
- changes in travel time and route.

8.2.16 Accordingly, PRISM can assess a wide range of policy options or transport system interventions, as well as their impacts on specific segments of the population. It has been used as the primary source of regional transport modelling and, developed for the local authorities, is the benchmark model for wider area analysis.

8.2.17 PRISM has been used to assess:

- LTP submissions and targets;
- major development proposals; and
- major infrastructure projects, including metro extensions and park and ride, Active Traffic Management (ATM) and highway improvement schemes.

8.2.18 At the time of the TA there were two versions of PRISM, namely:

- an operating version with a base year of 2006; and
- a refresh version still under development with an interim 2011 base, incorporating recent observed data from a number of sources together with updated input assumptions, but with no operational forecast models.

8.2.19 Because the operating version with a base year of 2006 did not sufficiently reflect existing travel demands and patterns and the version with a base year of 2011 was still under development and was not anticipated to be complete within the timescales for this scheme, an interim 2011 PRISM base model was used "as is" with future year forecasts prepared using whatever was available from the PRISM refresh model at the time. The alternative approach is outlined below.

8.2.20 Cordoned networks and matrices were taken from the interim but updated 2011 base PRISM model and used to confirm and develop network and demand data for SATURN and VISSIM models of the Curzon Street and Interchange stations localities respectively.

8.2.21 In the case of the Curzon Street station area, the existing Birmingham City Centre SATURN model (BCCM) provided the initial or starting model. Covering the area within the Ring Road, and interfacing with PRISM (so that future year strategic-level demand changes can be taken into account), BCCM has an established status and has been used in the assessment of many major local developments and infrastructure projects in and around Birmingham City Centre, including the new layout of New Street station.

8.2.22 In the case of the Birmingham Interchange station area, an extended and updated version of an existing 2009 base VISSIM model of the Birmingham Interchange area (BIM VISSIM) was developed as the primary assessment tool. However, a SATURN counterpart (BIM SATURN) was developed to incorporate variable demand corrections in the forecast years - a process that would have otherwise been undertaken by PRISM had the full PRISM refresh been available.

8.2.23 The existing 2009 VISSIM model has been used in the recent past to support numerous regional growth fund funding applications, major planning applications (including Birmingham Airport Runway Extension) and other proposals for the local area, with relevant local authority, HA and DfT acceptance.

8.2.24 The extended and updated BIM VISSIM model focuses on the strategic and local road network in the vicinity of Birmingham Airport and the National Exhibition Centre (NEC), the majority of which was already covered by the original 2009 VISSIM model. Model additions included:

- an extension to the north to include M6 Junction 4 and M42 Junction 7a slip road; and
- additional local road links around the NEC, airport and existing train station and the proposed Birmingham Interchange station.

8.2.25 2012 base year BCCM SATURN and BIM SATURN and VISSIM models were developed and validated against 2012 traffic data.

8.2.26 2021 and 2031 reference matrices were derived using information obtained from the PRISM refresh work - more specifically, the PRISM Population Model and Travel Demand Models. The former contains a prototypical sampling procedure to predict future populations (given population targets) and car ownership. The latter predicts future travel demands using population projections from the Population Model.

8.2.27 Traffic generation and distribution assumptions from the scheme construction teams were used to develop future year Proposed Scheme construction scenarios.

8.2.28 Operational scenario trip generation and distribution assumptions used in the BCCM SATURN and BIM SATURN and VISSIM modelling were obtained from PLANET. The analysis of the impact on the public transport network was also based on PLANET outputs.

8.2.29 In the absence of a fully completed PRISM refresh, which would have provided the variable demand response (i.e. the changes in trip making from, in particular, changes in congestion and delays and, potentially, mode shift) in the future years resulting from general growth and the Proposed Scheme, an alternative approach to the modelling of variable demand was necessary. The elasticity approach applied to the local SATURN modelling provided a pragmatic but sufficiently robust estimation of the scale of likely variable demand resulting in future years. It was adopted in consultation with West Midlands local authorities and the HA.

8.2.30 The adopted approach is considered both appropriate and proportionate given the actual outputs required, which were simply changes in traffic flows. Economic appraisal, where the emphasis lies in establishing changes in origin and destination and resulting changes in generalised cost and the assessment of a range of options, was not required.

8.2.31 Table 8-1 and Table 8-2 provide a summary of car trip growth forecasts by PRISM for the AM and PM Peak hours for 2021 and 2031. 2026 and 2036 growth forecasts were derived for application in this analysis via interpolation and extrapolation of these forecasts. LGV and OGV trip growth forecasts were taken from the DfT's National Road Traffic Forecasts (NRTF).

Table 8-1: PRISM future baseline scenario growth forecasts - AM peak hour

	AM peak hour (08:00-09:00) car trips				
Purpose	**2011**	**2021**	**2031**	**% Growth (2011-21)**	**% Growth (2011-31)**
Business	83,192	90,627	98,627	9%	19%
Commute	598,753	647,029	697,658	8%	17%
Education	26,226	28,986	32,058	11%	22%
Other	284,891	312,924	343,340	10%	21%
Total	993,061	1,079,565	1,171,682	9%	18%

Table 8-2: PRISM future baseline scenario growth forecasts - PM peak hour

	PM peak hour (17:00-18:00) car trips				
Purpose	**2011**	**2021**	**2031**	**% Growth (2011-21)**	**% Growth (2011-31)**
Business	97,260	106,104	115,651	9%	19%
Commute	615,592	665,189	717,214	8%	17%
Education	24,293	26,850	29,695	11%	22%

Other	431,690	473,298	517,367	10%	20%
Total	1,168,835	1,271,441	1,379,927	9%	18%

Sub-regional modelling

8.2.32 Traffic growth forecasts taken from PRISM as outlined above, together with the Proposed Scheme forecasts taken from PLANET were input to the BCCM SATURN and BIM SATURN and VISSIM highway models to assess the Curzon Street and Interchange stations localities. The approach taken in the assessment using these models is outlined below.

8.2.33 Outside of the Curzon Street and Interchange stations localities, growth forecasts taken from PRISM (consistent with DfT's TEMPRO national traffic forecasts) were applied to existing traffic count data to assess the impacts of the Proposed Scheme. Where PRISM model growth was not available or not appropriate, TEMPRO growth factors have been adopted with suitable adjustments for locally significant developments.

Birmingham City Centre SATURN model

8.2.34 The Birmingham City Centre (BCC) Land Use and Transportation Study (LUTS) Model was developed for Birmingham City Council for the assessment of land use and highway/public transport schemes within the City Centre Ring road.

8.2.35 The current BCC LUTS model consists of the following:

- land use scenarios within the city centre;
- strategic LUTS PRISM Model (including an enhanced city centre zoning system);
- Car Park Model; and
- SATURN simulation model of the City Centre.

8.2.36 For this assessment the Car Park Model and SATURN simulation model were used.

8.2.37 BCCM is used by local authorities in the West Midlands (mainly Birmingham City Council) to assess the impact of major development and proposed schemes in Birmingham City Centre. Therefore, the model is the most appropriate platform on which to assess the impacts of Curzon Street Station in the city centre. Furthermore, the model has an established interface with the PRISM model, which enables the model to have a direct correspondence in terms of the application of future growth.

8.2.38 The BCCM SATURN model was updated to a 2012 base year for the study area. The purpose of the update was to enable more accurate modelling of traffic movements and delays within congested parts of the city. The model performance report for the BCCM model, describing the development, calibration and validation of the model, is contained within Annex C. A summary of the base year model's link flow validation performance is given in Table 8-3.

Table 8-3: BCCM SATURN model performance summary

DMRB guidance	AM peak hour (08:00-09:00)	Av. inter peak hour (10:00-16:00)	PM peak hour (17:00--18:00)
Link flow differences	83%	94%	81%
GEH >5	77%	74%	77%

8.2.39 The DMRB and DfT WebTAG (Transport Appraisal Guidance) guidance focuses on link flow validation and considers the actual difference between modelled and observed link flows with a differential target dependent on the level of flow on a link together with the GEH (Geoffrey Havers) statistic as a measure of the goodness of fit between modelled and observed flows. This guidance indicates a benchmark for the GEH statistic of 85% of modelled flows having a GEH statistic of less than 5.

8.2.40 Whilst not fully achieving 85%, the validation statistics shown in Table 8-3 indicate that, from a link flow perspective, the BCCM SATURN model provides a sufficiently robust basis on which to assess the impacts of the Proposed Scheme in Birmingham City Centre.

8.2.41 The impact of the Proposed Scheme on Curzon Street station was assessed by adjusting forecast boarders/alighters at Curzon Street so that they reflect those from PLANET forecasts.

8.2.42 Appropriate adjustments were also made to the Proposed Scheme scenarios to development sites on the site area of the Curzon Street station with planning consent but which will no longer take place due to the Proposed Scheme.

8.2.43 An elasticity based approach was used to assess the likely demand response to future growth in the city centre as well as to that of the implementation of the Proposed Scheme. The elasticity response resulted in 5%, 8% and 10% reductions in trips in the future baseline scenario in the 2021, 2026 and 2041 peak hours.

8.2.44 Outputs from the model including link volumes, queue lengths, junction delays, volume/capacity ratios as well as outputs required for the EIA were produced.

Birmingham Interchange SATURN and VISSIM models

8.2.45 Two models were developed for the Birmingham Interchange area:

- a SATURN-based model to effect elasticity corrections consistent with the approach adopted for the BCCM (if a fully completed PRISM refresh had been available, variable demand responses would have been accounted for at PRISM level); and
- a VISSIM-based highway model to enable more detailed assessment of the impact on the Proposed Scheme on the highway network around Birmingham Interchange station.

8.2.46 The BIM SATURN model was specifically developed for the assessment of the Proposed Scheme using a cordon from the PRISM model.

8.2.47 The BIM VISSIM model comprises an updated and expanded version of an existing model covering the area around Interchange station, originally developed to assess a number of major planning applications including Birmingham Airport Runway Extension and the A45 Transport Corridor Major Scheme Bid. It contains the local highway network around the proposed Birmingham Interchange station and extends to include M42 Junction 6, which will be important in ensuring accessibility to the station. It covers the same network area as the BIM SATURN model.

8.2.48 Growth from the BIM SATURN model was applied to base year traffic flows to generate future year flows generally and more specifically for the BIM VISSIM model.

Birmingham Interchange SATURN model

8.2.49 The model performance report for the 2012 base year BIM SATURN model, describing the development, calibration and validation of the model, is contained within Annex C. Table 8-4 provides a summary of the base year model's link flow validation performance.

Table 8-4: BIM SATURN model performance summary

DMRB guidance	AM peak hour (08:00-09:00)	Av. inter peak hour (10:00-16:00)	PM peak hour (17:00-18:00)
Link flow differences	78%	81%	83%
GEH >5	78%	78%	78%

8.2.50 Whilst not achieving 85%, the validation statistics shown in Table 8-4 indicate that, from a link flow perspective, the BIM SATURN model provides a sufficiently robust basis on which to base the assessment of the impact of the Proposed Scheme in the Birmingham Interchange station area.

8.2.51 Appropriate adjustments were also made in the Proposed Scheme Scenario to allow for additional growth at development sites adjacent to the proposed site, such as Birmingham Airport and the NEC.

8.2.52 An elasticity based approach was used to assess the likely demand response to future growth around Birmingham Interchange station as well as that of the implementation of the Proposed Scheme. The elasticity response resulted in a negligible change in trips in both the future baseline and operational scenarios in both 2026 and 2041. This was mainly due to the large average trip length for trips on the network around Birmingham Interchange station, dominated by long distance movements on the M42.

8.2.53 Outputs from the model including link volumes, queue lengths, junction delays, volume/capacity ratios as well as outputs required for the EIA were produced. Further, the model provided future year trip matrix growth for the Birmingham Interchange VISSIM model.

Birmingham Interchange VISSIM model

8.2.54 Detailed analysis of the highway network in the vicinity of Birmingham Interchange station, without and with mitigation, was undertaken using the BIM VISSIM model. The model performance report for the 2012 base year BIM VISSIM model, describing the development, calibration and validation of the model, is contained within Annex C. Table 8-5 provides a summary of the base year model's turning flow validation performance.

Table 8-5: BIM VISSIM model performance summary

DMRB guidance		**AM peak hour (08:00-09:00)**	**Av. inter peak hour (10:00-16:00)**	**PM peak hour (17:00-18:00)**
Link flow differences	Flows <700 vph	91%	-	96%
	Flows 700-2,700 vph	100%	-	75%
GEH <5		89%	-	87%

8.2.55 The validation statistics shown in Table 8-5 indicate that, from a turning flow perspective, the BIM VISSIM model provides a sufficiently robust basis on which to base the assessment of the impact of the Proposed Scheme in the Birmingham Interchange station area.

PLANET - HS2 forecast rail impacts

8.2.56 Inputs from the PLANET model in terms of forecast HS2 boarders and alighters were used in the regional public transport network analysis.

8.2.57 Daily (16 hour) boardings and alightings from PLANET (more specifically, the Station Choice Model (SCM) within the PLANET Long Distance (PLD) sub models) were provided by HS2 Ltd for the key strategic stations in the West Midlands. These stations included Birmingham New Street, International, Moor Street and Snow Hill as well as for Interchange and Curzon Street stations in the future year scenarios.

8.2.58 The boardings and alightings were provided in origin-destination format, showing origin zone for boarders and destination zone for alighters, together with details of access and egress mode (public transport or highway mode), trip purpose (leisure, commute and business) and by car availability. The 16 hour boarding and alighting forecasts are shown in Table 8-6 for Birmingham Interchange station and Table 8-7 for Birmingham Curzon Street. These are shown for 2026 Phase One and 2041 Phase Two.

8.2.59 It should be noted that PLANET produces forecasts for a future year of 2036. As the forecast year being used in this assessment is 2041, an uplift factor of approximately 10% was applied to the 2036 forecasts to produce 2041 forecasts. This was based on an analysis of the long term growth of long distance trips forecast by PLANET in the West Midlands (between 2011 and 2036). A lower factor of approximately 5% was applied to shorter distance trips in the West Midlands based upon the same

Table 8-6: Birmingham Interchange station boarding/alighting forecasts (16 hour person trips)

		2026 Phase 1 scenario	**2041 Phases 1 & 2 scenario**
Highway	Boarders	6,495	11,225
	Alighters	5,624	9,635
Public transport	Boarders	2,666	4,708
	Alighters	2,921	5,139
Rail- rail interchangers		3,762	7,177
Total		21,468	37,884

Table 8-7: Table 7: Birmingham Curzon Street station boarding/alighting forecasts (16 hour person trips)

		2026 Phase 1 scenario	**2041 Phases 1 & 2 scenario**
Highway	Boarders	1,413	2,580
	Alighters	1,256	2,277
Public transport	Boarders	6,339	13,603
	Alighters	6,769	14,617
Rail-rail interchangers		9,066	32,782
Total		24,843	65,859

8.2.60 Because PLANET outputs are at the 16 hour level, it was necessary to develop time period factors to generate peak period demands. These were developed based on analysis of long distance rail travel data for rail trips between the West Midlands and London, including the National Rail Travel Survey (NRTS), which was used as the basis for the time period factors, and passenger survey data collected at International and New Street stations in 2012.

8.2.61 Table 8-8 summarises the time period factors used to convert the PLANET 16 hour demand forecasts to specific time periods for Birmingham Interchange station and Curzon Street station.

Table 8-8: Time period factors comparison

	Birmingham Interchange station factors		**Birmingham Curzon Street station factors**	
Time period	Boarders	Alighters	Boarders	Alighters
05:00-06:00	1%	0%	1%	0%
06:00-07:00	8%	0%	5%	0%
07:00-08:00	16%	0%	11%	0%
08:00-09:00	14%	4%	10%	4%
09:00-10:00	7%	4%	8%	9%
10:00-11:00	8%	5%	7%	5%
11:00-12:00	8%	4%	6%	10%
12:00-13:00	5%	4%	6%	4%
13:00-14:00	12%	6%	7%	9%
14:00-15:00	4%	4%	12%	4%
15:00-16:00	6%	7%	7%	6%
16:00-17:00	5%	16%	8%	9%
17:00-18:00	2%	19%	5%	10%
18:00-19:00	3%	14%	4%	13%
19:00-20:00	1%	10%	1%	13%
20:00-21:00	0%	4%	3%	5%

8.2.62 Peak hour boarding and alighting flows were then used, as needed, in the West Midlands models.

8.2.63 The next step was to disaggregate the peak hour boarding and alighting flows into station access sub modes. Again this was undertaken by applying sub mode factors taken from the NRTS dataset (based on long distance rail movements between the West Midlands and London).

8.2.64 The sub-mode access factors applied at Birmingham Interchange station are shown in Table 8-9.

Table 8-9: Birmingham Interchange mode share factors

Mode	Boarders		Alighters	
	AM peak hour (08:00-09:00)	PM peak hour (17:00-18:00)	AM peak hour (08:00-09:00)	PM peak hour (17:00- 18:00)
Car parked	70%	10%	10%	70%
Taxi	4%	20%	15%	10%
Bus	4%	4%	7%	5%
Walk/cycle	3%	30%	30%	3%
Other trains*	5%	10%	10%	5%
Kiss and ride	10%	15%	17%	3%
People mover**	4%	11%	11%	4%

* assumed to be accessing local trains (rail to rail interchanges are treated as separate trips and are therefore also assumed to use the people mover)
** assumed to be trips accessing the airport, NEC and local business parks.

8.2.65 The sub-mode access factors applied at Birmingham Curzon Street station are shown in Table 8-10 and Table 8-11.

Table 8-10: Birmingham Curzon Street station highway mode share factors

Time period	Boarders				Alighters			
	Taxi	Kiss and ride	Car park	Total	Taxi	Kiss and ride	Car park	Total
AM peak hour (08:00-09:00)	30%	30%	40%	100%	90%	5%	5%	100%
PM peak hour (17:00-18:00)	82%	16%	2%	100%	40%	25%	35%	100%

Table 8-11: Birmingham Curzon Street station public transport mode share factors

Time Period	Boarders				Alighters			
	Bus	Walk	Cycle	Total	Bus	Walk	Cycle	Total
AM peak hour (08:00-09:00)	45%	43%	2%	10%	100%	15%	70%	0%
PM peak hour (17:00-18:00)	5%	89%	0%	6%	100%	35%	44%	1%

8.2.66 The implications of the use of these mode share assumptions are considered in the specific CFA sub-sections.

Local assessment - junction modelling

8.2.67 Outputs from the BCCM model were used to identify the junctions that were to be assessed further through local road network modelling in terms of impacts on the network around Curzon Street station. The BIM VISSM model was used to do the same for Interchange station. The use of local models is considered as appropriate in the CFA specific sub-sections.

Public transport impacts

8.2.68 The impact of the Proposed Scheme on the public transport network within the West Midlands was undertaken using data from PLANET and other sources. A number of different impacts were assessed, including:

- bus network impacts;
- rail network impacts;
- connectivity around Curzon Street station (links to Moor Street, impact on Moor Street Queensway, impact on Moor Street station and connections to New Street station); and
- connectivity at Birmingham Interchange station with Birmingham International station.

8.2.69 The analysis of and conclusions for each of these impacts is outlined in each of the CFA sub-sections of this report.

Construction assumptions

8.2.70 Traffic generation movements during construction are centred on worksite compounds. Two types of compound will be established; those to undertake the civil engineering tasks required to build the scheme and those to install track and railway systems such as signalling, power and communications. Generally, the railway systems compounds will be operational once the civil engineering tasks are complete.

8.2.71 The railway systems compounds will in most cases share space at selected civil engineering compounds. A limited number of additional railway systems compounds will be established.

8.2.72 HGV generations associated with rail systems compounds are expected to be substantially less than generations associated with civil engineering compounds.

8.2.73 Construction workforce numbers have been estimated for each compound. Two types of employee have been identified as follows:

- workers - comprising skilled, semi-skilled and unskilled construction workers; and

- staff - comprising management, engineering design staff and administration.

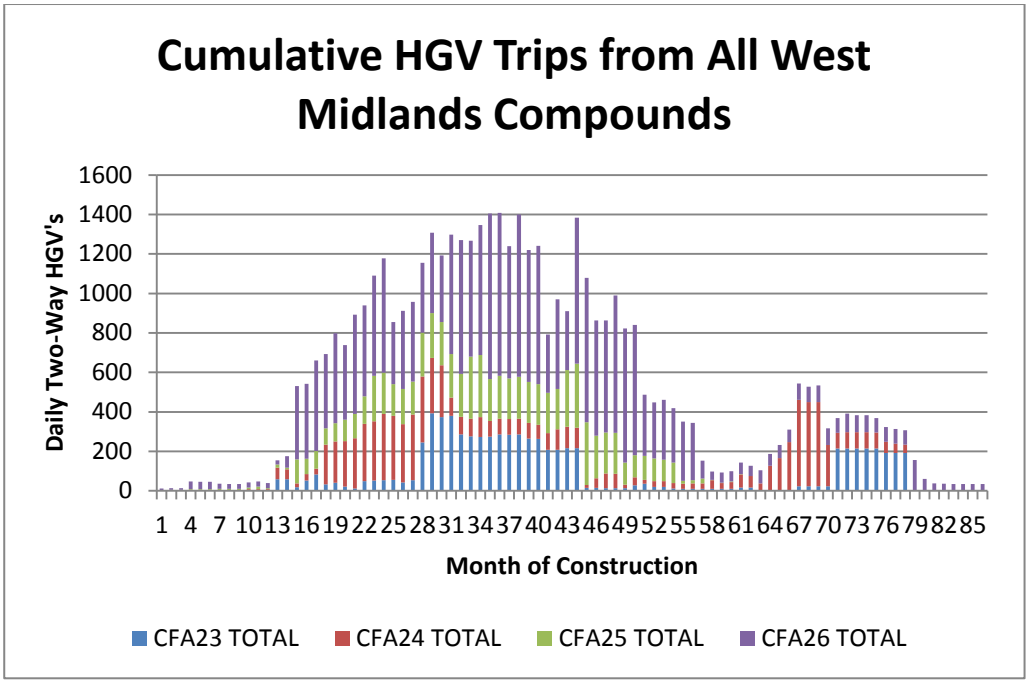
8.2.74 It is assumed that workforce numbers will vary over time in line with activity on the site.

Trip generation

8.2.75 HGV numbers have been calculated for the individual compounds based on activities, material quantities and timescales using first principles. The nature and scale of the works at each compound is different and displays a unique profile of HGV generation over the build programme. If follows therefore that each CFA displays a different profile.

8.2.76 The cumulative impact across the West Midlands region is calculated by combining each of the individual CFA's and results in Figure 8-2.

Figure 8-2: Cumulative HGV trips from all West Midlands compounds



8.2.77 The calculated cumulative peak for the West Midlands region is 1,408 two-way HGV's per day during month 36 of construction.

8.2.78 Assessment is based upon flows in months 30, 35 and 44 to ensure that region-wide, CFA-wide and localised changes in activity are assessed.

8.2.79 The total average workforce for the West Midlands region, if all compounds were working simultaneously, would be 1,562 workers and 484 staff. It is noted however that not all compounds do work simultaneously.

Mode share

8.2.80 Movement of all materials to and from compounds during the civil engineering works is assumed to be by HGV.

8.2.81 Movement of materials to and from compounds associated with railway systems works will largely be undertaken by rail therefore minimising the number of HGVs associated with this phase of construction.

8.2.82 It is assumed that 80% of workers will travel to and from their usual place of residence on a daily basis and that 20% will be resident throughout the working week at a temporary accommodation camp located within CFA23.

8.2.83 For assessment purposes, and with the exception of two compounds in CFA26 (Curzon Street No.3 Viaduct and Curzon Street station), all workers and staff travelling to/from their home address will all travel by car with a car occupancy of two for workers and one for staff.

8.2.84 In the case of the two compounds in CFA26 (Curzon Street No.3 Viaduct and Curzon Street station) 42.2% of all workers and staff travelling to/from their home address will travel by car with a car occupancy of two for workers and one for staff.

8.2.85 For the 20% who reside throughout the working week in the accommodation camp, the following assumptions are applied:

- workers who are within 750 metres of their compound will walk to and from work; and
- all other workers will utilise site buses to travel to and from work.

Distribution

8.2.86 Longer distance HGV traffic accessing compounds are assumed to utilise the national motorway network to enter the West Midlands region. The M6, M42 and M69 could be utilised from the north, the M6 and M5 from the west, the M6 from the east and the M40/M42 and M1/M6 from the south.

8.2.87 Under the employee category of workers, the distribution for workers who commute on a daily basis from their usual place of residence is based on a gravity model applying the population data for the 2011 census of population by local areas within a one hour journey time.

8.2.88 For all compounds in the West Midlands region, approximately 70% of all workers would arrive from the Birmingham, Coventry and Solihull areas. This is not surprising given the spatial relationship of the construction areas to the large urban areas which provide a significant potential supply of workers.

8.2.89 The distribution of workers who would reside throughout the working week in the temporary accommodation camp is based on census data for construction workers nationally. Resident workers would stay at the accommodation camp during the week and it is assumed would commute to the accommodation site on a Sunday evening or early Monday morning and depart on a Friday evening or early afternoon on a Saturday.

Assignment

8.2.90 The HGV trips have been assigned onto the network using the most appropriate route between the point of origin if known or the nearest junction on the strategic network and the specified compound gate of entry. Motorways and A-class roads have been used where possible with lesser standard roads only being used where no alternative is available for accessing the compounds.

8.2.91 Workers and staff trips have been assigned onto the network based on a desk-top based assessment of available routes utilising the quickest most appropriate route between the point of origin and the specific compound.

8.3 Balsall Common and Hampton-in-Arden (CFA23)

Balsall Common and Hampton-in-Arden (CFA23) Proposed Scheme description

8.3.1 Figure 2, Volume 2 (CFA23) details the location of the CFA. Stoneleigh, Kenilworth and Burton Green (CFA18) lies to the south and Birmingham Interchange and Chelmsley Wood (CFA24) lies to the north.

8.3.2 The area is predominantly rural in character, with agriculture being the main land use, interspersed with small villages and a scattering of isolated dwellings and farmsteads. The urban areas mainly relate to Balsall Common and Hampton-in-Arden, the latter of which is designated as a Conservation Area, in a largely undeveloped area of agricultural land known as the 'Meriden Gap'. Within the wider rural area there are a number of historic villages, including Berkswell, Barston and Temple Balsall, which are also designated as Conservation Areas.

8.3.3 The Proposed Scheme through the area (see Map CT-06-100b to Map CT-06-105a, Volume 2, Map Book 23) will be approximately 7.8km in length. It will commence north-west of Waste Lane, adjacent to the Kenilworth Greenway and then proceed towards the existing Rugby to Birmingham railway, crossing it south-east of Berkswell railway station. South-east of this station, the route will diverge from the Kenilworth Greenway and cross Truggist Lane and several PRoW including the Millennium Way and the Heart of England Way (Footpath M214). The route will then continue broadly parallel to the A452 Kenilworth Road which it will cross in close proximity to Marsh Lane Nature Reserve. It will then cross over Meriden Road and Diddington Lane and leave this area south-east of the A45 Coventry Road, near to Pasture Farm.

Assessment methodology

8.3.4 The assessment methodology is consistent with that outlined in the regional methodology section of the report for the West Midlands with the exceptions outlined in the following sections.

Balsall Common and Hampton-in-Arden (CFA23) future baseline

Key future baseline transport issues

8.3.5 The key transport changes in relation to the Balsall Common and Hampton-in-Arden area are expected to relate to general background growth in traffic flows between 2012 and 2041, irrespective of the Proposed Scheme.

8.3.6 There are no substantial issues identified with the future baseline in this area.

Land use assumptions

8.3.7 For the Balsall Common and Hampton-in-Arden area, there are no major committed developments or land use changes. The Draft Solihull Local Plan identifies a number of sites for Proposed Housing Sites; Preferred Area Mineral Sites; a Mineral Safeguarding Area/Area of Search; an Area of Search for Waste Management Facilities; and a Mineral Safeguarding Area for Coal, but the proposed housing sites and mineral sites would not be expected to have any substantial impacts on future traffic and transport conditions, whilst the area safeguarded for coal has not been considered in the modelling.

8.3.8 Future baseline traffic conditions therefore have been based on a combination of PRISM model and TEMPRO growth rates.

8.3.9 PRISM model growth has been applied to the 2012 traffic count data for the strategic route of the A452 Kenilworth Road through the area and is advised by the assessments undertaken in the adjacent Birmingham Interchange and Chelmsley Wood area. The PRISM growth applied to flows on the A452 Kenilworth Road is summarised in Table 8-12.

Table 8-12: Summary of PRISM growth applied to strategic routes through CFA23

	AM peak hour (08:00-09:00)	**PM peak hour (17:00-18:00)**
2012 - 2021	11.6%	22.0%
2012 - 2026	14.0%	24.2%
2012 - 2041	17.4%	26.0%

8.3.10 For local road where model data is not available in and around the CFA, growth factors have been derived from TEMPRO and are summarised in Table 8-13.

Table 8-13: Summary of TEMPRO growth applied to local routes through CFA23

	AM peak hour (08:00-09:00)	**PM peak hour (17:00-18:00)**
2012 - 2021	7.1%	7.0%
2012 - 2026	10.9%	10.7%
2012 - 2041	21.3%	21.1%

Transport supply assumptions

8.3.11 There are no substantial committed changes to the transport network in the Balsall Common and Hampton-in-Arden area. Although the West Midlands Local Transport Plan (West Midlands LTP3) defines aspirations for encouraging a shift to more sustainable modes of travel; particularly public transport and for improving public transport accessibility between rural communities and important centres; no specific schemes are committed. They have therefore not been allowed for in the future baseline assessment.

Strategic road network traffic flows

8.3.12 The key strategic route through the area is the A452 Kenilworth Road. Table 8-14 and Table 8-15 summarise the 2021, 2026 and 2041 AM (08:00-09:00) and PM (17:00-18:00)peak forecast traffic flows for the A452, compared to 2012 and provide a summary of the V/C ratios for each location.

Table 8-14: Strategic road network AM peak hour (08:00-09:00) traffic flows 2021, 2026 and 2041 (vehicles)

Location	Direction	AM peak (08:00-09:00)											
		2012			2021			2026			2041		
		veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C
A452 Kenilworth Road (between Wootton Lane and Hallmeadow Road)	NB	929	16	25.8%	1036	18	28.8%	1059	19	29.4%	1091	19	30.3%
	SB	742	13	41.2%	828	15	46.0%	846	15	47.0%	871	15	48.4%
A452 Kenilworth Road (between Windmill Lane and Meer End Road)	NB	785	14	49.4%	876	16	55.1%	895	16	56.3%	922	16	58.0%
	SB	750	13	47.2%	837	15	52.6%	855	15	53.8%	881	16	55.4%
A452 Kenilworth Road (between Meriden Lane and Marsh Lane)	NB	1,005	18	27.9%	1,121	20	31.1%	1,146	20	31.8%	1,180	21	32.8%
	SB	807	14	22.4%	900	16	25.0%	920	16	25.6%	948	17	26.3%
A452 Kenilworth Road (between Station Road and Gypsy Lane)	NB	808	14	52.1%	901	16	58.2%	921	16	59.4%	949	17	61.2%
	SB	721	13	46.5%	804	14	51.9%	822	15	53.0%	847	15	54.6%

Location	Direction	AM peak (08:00-09:00)											
		2012			2021			2026			2041		
		veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C
A452 Kenilworth Road (south of Stonebridge Roundabout)	NB	1,044	48	29.0%	1165	54	32.4%	1,190	55	33.1%	1,226	57	34.1%
	SB	1,239	58	34.4%	1382	64	38.4%	1,413	66	39.2%	1,455	68	40.4%
A452 Kenilworth Road (between Lavender Hall Lane and Station Road)	NB	877	16	56.6%	978	17	63.1%	1,000	18	64.5%	1,030	18	66.4%
	SB	794	14	51.2%	886	16	57.2%	905	16	58.4%	932	17	60.2%
A452 Kenilworth Road (between Wootton Green Lane and Lavender Hall Lane)	NB	814	14	52.5%	908	16	58.6%	928	16	59.9%	956	17	61.7%
	SB	678	12	43.7%	756	13	48.8%	773	14	49.9%	796	14	51.4%
A452 Kenilworth Road (between Hallmeadow Road and Wootton Green Lane)	NB	817	14	52.7%	911	16	58.8%	932	17	60.1%	959	17	61.9%
	SB	658	12	42.5%	734	13	47.4%	750	13	48.4%	773	14	49.9%
A452 Kenilworth Road (between Park Lane and Wootton Lane)	NB	890	16	24.7%	993	18	27.6%	1015	18	28.2%	1045	19	29.0%
	SB	750	13	20.8%	837	15	23.2%	855	15	23.8%	881	16	24.5%
A452 Kenilworth Road (between Bradnocks Marsh Lane and Park Lane)	NB	904	16	25.1%	1009	18	28.0%	1031	18	28.6%	1062	19	29.5%
	SB	770	14	21.4%	859	15	23.9%	878	16	24.4%	904	16	25.1%
A452 Kenilworth Road (between	NB	997	18	27.7%	1112	20	30.9%	1137	20	31.6%	1171	21	32.5%

Location	Direction	AM peak (08:00-09:00)											
		2012			2021			2026			2041		
		veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C
Bradnocks Marsh Lane and Marsh Lane)	SB	804	14	22.3%	897	16	24.9%	917	16	25.5%	944	17	26.2%
A452 Kenilworth Road (between Windmill Lane and Kelsey Lane)	NB	644	11	40.5%	718	13	45.2%	734	13	46.2%	756	13	47.6%
	SB	598	11	37.6%	667	12	42.0%	663	12	41.7%	702	12	44.2%
A452 Kenilworth Road (between Gypsy Lane and Adler Lane)	NB	602	11	37.9%	672	12	42.2%	686	12	43.2%	707	13	44.5%
	SB	638	11	40.1%	712	13	44.8%	728	13	45.8%	749	13	47.1%
A452 Kenilworth Road (between Meriden Road and Diddington Lane)	NB	977	45	27.1%	1090	51	30.3%	1,114	52	30.9%	1,147	53	31.9%
	SB	1,196	56	33.2%	1,334	62	37.1%	1,364	63	37.9%	1,405	65	39.0%
A452 Kenilworth Road (south of Meer End Road)	NB	512	9	32.2%	571	10	35.9%	584	10	36.7%	601	11	37.8%
	SB	443	8	27.9%	494	9	31.1%	505	9	31.8%	520	9	32.7%

Table 8-15: Strategic road network PM peak hour (17:00-18:00) traffic flows 2021, 2026 and 2041, (vehicles)

Location	Direction	PM peak (17:00-18:00)											
		2012			2021			2026			2041		
		veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C
A452 Kenilworth Road (between Wootton Lane and Hallmeadow Road)	NB	768	16	21.3%	937	20	26.0%	954	20	26.5%	968	21	26.9%
	SB	946	20	52.6%	1,154	25	64.1%	1,175	25	65.3%	1,192	25	66.2%

Location	Direction	PM peak (17:00-18:00)											
		2012			2021			2026			2041		
		veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C
A452 Kenilworth Road (between Windmill Lane and Meer End Road)	NB	813	17	51.1%	992	21	62.4%	1,010	22	63.5%	1,025	22	64.4%
	SB	765	16	48.1%	933	20	58.7%	950	20	59.8%	964	21	60.6%
A452 Kenilworth Road (between Meriden Lane and Marsh Lane)	NB	813	17	22.6%	992	21	27.5%	1,010	22	28.0%	1,025	22	28.5%
	SB	1,099	23	30.5%	1,340	29	37.2%	1,365	29	37.9%	1,385	30	38.5%
A452 Kenilworth Road (between Station Road and Gypsy Lane)	NB	798	17	51.5%	973	21	62.8%	991	21	63.9%	1,006	21	64.9%
	SB	700	15	45.2%	854	18	55.1%	869	19	56.1%	882	19	56.9%
A452 Kenilworth Road (south of Stonebridge Roundabout)	NB	1,102	68	30.6%	1344	83	37.3%	1,369	84	38.0%	1,389	86	38.6%
	SB	1,315	81	36.5%	1604	99	44.5%	1,633	101	45.4%	1,657	102	46.0%
A452 Kenilworth Road (between Lavender Hall Lane and Station Road)	NB	734	16	47.4%	895	19	57.8%	912	19	58.8%	925	20	59.7%
	SB	914	20	59.0%	1,115	24	71.9%	1,135	24	73.2%	1,152	25	74.3%
A452 Kenilworth Road (between Wootton	NB	668	14	43.1%	815	17	52.6%	830	18	53.5%	842	18	54.3%

Location	Direction	PM peak (17:00-18:00)											
		2012			2021			2026			2041		
		veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C
Green Lane and Lavender Hall Lane)	SB	846	18	54.6%	1,032	22	66.6%	1,051	22	67.8%	1,066	23	68.8%
A452 Kenilworth Road (between Hallmeadow Road and Wootton Green Lane)	NB	665	14	42.9%	811	17	52.3%	826	18	53.3%	838	18	54.1%
	SB	846	18	54.6%	1,032	22	66.6%	1,051	22	67.8%	1,066	23	68.8%
A452 Kenilworth Road (between Park Lane and Wootton Lane)	NB	740	16	20.6%	903	19	25.1%	919	20	25.5%	933	20	25.9%
	SB	934	20	25.9%	1,139	24	31.6%	1,160	25	32.2%	1,177	25	32.7%
A452 Kenilworth Road (between Bradnocks Marsh Lane and Park Lane)	NB	757	16	21.0%	923	20	25.6%	940	20	26.1%	954	20	26.5%
	SB	928	20	25.8%	1,132	24	31.4%	1,152	25	32.0%	1,169	25	32.5%
A452 Kenilworth Road (between Bradnocks Marsh Lane and Marsh Lane)	NB	813	17	22.6%	992	21	27.5%	1,010	22	28.0%	1,025	22	28.5%
	SB	1,071	23	29.8%	1,306	28	36.3%	1,330	28	36.9%	1,350	29	37.5%
A452 Kenilworth Road (between Windmill Lane and Kelsey Lane)	NB	698	15	43.9%	851	18	53.5%	867	19	54.5%	880	19	55.3%
	SB	628	13	39.5%	766	16	48.2%	695	15	43.7%	791	17	49.8%

Location	Direction	PM peak (17:00-18:00)											
		2012			2021			2026			2041		
		veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C
A452 Kenilworth Road (between Gypsy Lane and Adler Lane)	NB	614	13	38.6%	749	16	47.1%	763	16	48.0%	774	17	48.7%
	SB	696	15	43.8%	849	18	53.4%	864	18	54.4%	877	19	55.2%
A452 Kenilworth Road (between Meriden Road and Diddington Lane)	NB	979	60	27.2%	1,194	74	33.2%	1,216	75	33.8%	1,234	76	34.3%
	SB	1,292	80	35.9%	1,576	97	43.8%	1,604	99	44.6%	1,628	101	45.2%
A452 Kenilworth Road (south of Meer End Road)	NB	420	9	26.4%	512	11	32.2%	522	11	32.8%	529	11	33.3%
	SB	500	11	31.4%	610	13	38.4%	621	13	39.1%	630	13	39.6%

8.3.13 Table 8-15 shows flows for the A452 Kenilworth Road at various locations along its route. The table shows that the level of flows forecast are expected to be well within the capacity of the A452 Kenilworth Road even in the future years.

Local road network traffic flows

8.3.14 There are a number of local roads in the area most of which will be unaffected by the Proposed Scheme. Table 8-16 and Table 8-17 summarises 2021, 2026 and 2041 AM (08:00-09:00) and PM (17:00-18:00)peak forecast traffic flows for roads where it is anticipated that there is the potential for a substantial impact either during construction or through the operation of the scheme.

Table 8-16: Local road network AM peak hour (08:00-09:00) traffic flows 2021, 2026 and 2041, (vehicles)

Location	Direction	AM peak (08:00-09:00)											
		2012			2021			2026			2041		
		veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C
Windmill Lane between Hob Lane and Kenilworth Road	NB	173	1	23.1%	185	1	24.7%	192	1	25.6%	210	1	28.0%
	SB	138	1	18.4%	148	1	19.7%	153	1	20.4%	167	1	22.3%
Windmill Lane between Hob Lane and Kelsey Lane	NB	114	0	15.2%	122	0	16.3%	126	0	16.9%	138	1	18.4%
	SB	145	1	19.3%	155	1	20.7%	161	1	21.4%	176	1	23.5%
Hob Lane	EB	114	0	15.2%	122	0	16.3%	126	0	16.9%	138	1	18.4%
	WB	44	0	5.9%	47	0	6.3%	49	0	6.5%	53	0	7.1%
Kelsey Lane between Kenilworth Road and Meeting House Lane	EB	347	2	31.3%	372	2	33.5%	385	2	34.7%	421	2	37.9%
	WB	242	1	21.8%	259	1	23.4%	268	1	24.2%	294	2	26.5%
Waste Lane	EB	430	2	38.7%	461	3	41.5%	477	3	43.0%	522	3	47.0%
	WB	279	2	25.1%	299	2	26.9%	309	2	27.9%	339	2	30.5%
Lavender Hall Lane between A452 Kenilworth Road and Hallmeadow Road	EB	93	0	12.4%	100	0	13.3%	103	0	13.8%	113	0	15.0%
	WB	106	0	14.1%	114	0	15.1%	118	0	15.7%	129	0	17.1%
Lavender Hall Lane between Hallmeadow Road and Park Lane	EB	135	0	18.0%	145	1	19.3%	150	1	20.0%	164	1	21.8%
	WB	187	1	24.9%	200	1	26.7%	207	1	27.6%	227	1	30.3%
Lavender Hall Lane between Park Lane and Spencer's Lane	EB	166	1	22.1%	178	1	23.7%	184	1	24.5%	201	1	26.9%
	WB	187	1	24.9%	200	1	26.7%	207	1	27.6%	227	1	30.3%

Location	Direction	AM peak (08:00-09:00)											
		2012			2021			2026			2041		
		veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C
Hallmeadow Road between Lavender Hall Lane and A452 Kenilworth Road	EB	91	0	8.0%	97	0	8.6%	101	0	8.9%	110	0	9.7%
	WB	121	0	10.6%	130	0	11.4%	134	0	11.8%	147	1	12.9%
Park Lane	EB	39	0	5.2%	42	0	5.6%	43	0	5.8%	47	0	6.3%
	WB	2	0	0.3%	2	0	0.3%	2	0	0.3%	2	0	0.3%
Meriden Road between A452 Kenilworth Road and Diddington Lane	EB	287	2	25.9%	511	3	46.0%	501	3	45.1%	511	3	46.1%
	WB	308	2	27.7%	548	3	49.4%	537	3	48.4%	549	3	49.4%
Meriden Road west of Diddington Lane	EB	408	2	36.8%	726	4	65.4%	712	4	64.1%	727	4	65.5%
	WB	313	2	28.2%	557	3	50.2%	546	3	49.2%	558	3	50.2%
Diddington Lane at Meriden Road	NB	126	0	16.8%	224	1	29.9%	220	1	29.3%	224	1	29.9%
	SB	10	0	1.3%	18	0	2.4%	17	0	2.3%	18	0	2.4%
Diddington Lane at A452 Kenilworth Road	EB	110	0	14.7%	196	1	26.1%	192	1	25.6%	196	1	26.1%
	WB	23	0	3.1%	41	0	5.5%	40	0	5.4%	41	0	5.5%
Hampton Lane east of A452 Kenilworth Road	EB	356	2	32.1%	634	4	57.1%	621	3	56.0%	634	4	57.1%
	WB	322	2	29.0%	573	3	51.6%	562	3	50.6%	574	3	51.7%
Spencer Lane between Coventry Road and Baulk Lane	NB	142	1	18.9%	152	1	20.3%	157	1	21.0%	172	1	23.0%
	SB	337	1	44.9%	361	1	48.1%	374	1	49.8%	409	1	54.5%
Spencer Lane between Baulk Lane and Truggist Lane NB	NB	127	0	16.9%	136	0	18.1%	141	1	18.8%	154	1	20.5%
	SB	332	1	44.3%	356	1	47.4%	368	1	49.1%	403	1	53.7%

Table 8-17: Local road network PM peak hour (17:00-18:00) traffic flows 2021, 2026 and 2041, (vehicles)

Location	Direction	PM peak (17:00-18:00)											
		2012			2021			2026			2041		
		veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C
Windmill Lane between Hob Lane and Kenilworth Road	NB	154	1	20.5%	165	1	22.0%	171	1	22.7%	186	1	24.9%
	SB	136	1	18.1%	145	1	19.4%	151	1	20.1%	165	1	22.0%
Windmill Lane between Hob Lane and Kelsey Lane	NB	167	1	22.3%	179	1	23.8%	185	1	24.7%	202	1	27.0%
	SB	92	1	12.3%	98	1	13.1%	102	1	13.6%	111	1	14.9%
Hob Lane	EB	40	0	5.3%	43	0	5.7%	44	0	5.9%	48	0	6.5%
	WB	102	1	13.6%	109	1	14.5%	113	1	15.1%	123	1	16.5%
Kelsey Lane between Kenilworth Road and Meeting House Lane	EB	188	1	16.9%	201	1	18.1%	208	1	18.8%	228	1	20.5%
	WB	331	2	29.8%	354	2	31.9%	367	2	33.0%	401	3	36.1%
Waste Lane	EB	259	2	23.3%	277	2	25.0%	287	2	25.8%	314	2	28.3%
	WB	356	2	32.1%	381	2	34.3%	394	3	35.5%	431	3	38.8%
Lavender Hall Lane between A452 Kenilworth Road and Hallmeadow Road	EB	86	1	11.5%	92	1	12.3%	95	1	12.7%	104	1	13.9%
	WB	78	1	10.4%	83	1	11.1%	86	1	11.5%	94	1	12.6%
Lavender Hall Lane between Hallmeadow Road and Park Lane	EB	102	1	13.6%	109	1	14.5%	113	1	15.1%	123	1	16.5%
	WB	131	1	17.5%	140	1	18.7%	145	1	19.3%	159	1	21.1%
Lavender Hall Lane between Park Lane and Spencer's Lane	EB	129	1	17.2%	138	1	18.4%	143	1	19.0%	156	1	20.8%
	WB	132	1	17.6%	141	1	18.8%	146	1	19.5%	160	1	21.3%

Location	Direction	PM peak (17:00-18:00)											
		2012			2021			2026			2041		
		veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C
Hallmeadow Road between Lavender Hall Lane and A452 Kenilworth Road	EB	89	1	7.8%	95	1	8.4%	99	1	8.6%	108	1	9.5%
	WB	108	1	9.5%	116	1	10.1%	120	1	10.5%	131	1	11.5%
Park Lane	EB	33	0	4.4%	35	0	4.7%	37	0	4.9%	40	0	5.3%
	WB	4	0	0.5%	4	0	0.6%	4	0	0.6%	5	0	0.6%
Meriden Road between A452 Kenilworth Road and Diddington Lane	EB	356	2	32.1%	440	3	39.6%	447	3	40.2%	619	4	55.7%
	WB	335	2	30.2%	414	3	37.3%	420	3	37.9%	582	4	52.5%
Meriden Road west of Diddington Lane	EB	446	3	40.2%	551	4	49.6%	559	4	50.4%	775	5	69.8%
	WB	362	2	32.6%	447	3	40.3%	454	3	40.9%	629	4	56.7%
Diddington Lane at Meriden Road	NB	121	1	16.1%	149	1	19.9%	152	1	20.2%	210	1	28.0%
	SB	23	0	3.1%	28	0	3.8%	29	0	3.8%	40	0	5.3%
Diddington Lane at A452 Kenilworth Road	EB	136	1	18.1%	168	1	22.4%	171	1	22.7%	236	2	31.5%
	WB	8	0	1.1%	10	0	1.3%	10	0	1.3%	14	0	1.9%
Hampton Lane east of A452 Kenilworth Road	EB	506	3	45.6%	625	4	56.3%	635	4	57.2%	880	6	79.2%
	WB	403	3	36.3%	498	3	44.8%	506	3	45.5%	701	5	63.1%
Spencer Lane between Coventry Road and Baulk Lane	NB	294	1	39.2%	315	1	41.9%	326	1	43.4%	356	1	47.5%
Spencer Lane between Coventry Road and Baulk Lane	SB	113	0	15.1%	121	0	16.1%	125	0	16.7%	137	0	18.2%

Location	Direction	PM peak (17:00-18:00)											
		2012			2021			2026			2041		
		veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C
SB													
Spencer Lane between Baulk Lane and Truggist Lane	NB	289	1	38.5%	309	1	41.2%	320	1	42.7%	350	1	46.7%
Spencer Lane between Baulk Lane and Truggist Lane SB	SB	107	0	14.3%	114	0	15.3%	118	0	15.8%	130	0	17.3%

8.3.15 Table 8-16 and Table 8-17 show flows for local roads at various locations in the area for the AM (08:00-09:00) and PM peak hour (17:00-18:00). Typically, the level of flows forecast are low and expected to be well within the capacity of the roads.

Accidents and safety

8.3.16 A full network safety analysis has been undertaken for 2012 in the baseline assessment. No issues have been identified for the future baseline network operation as a result of changes to the highway network or travel demands, and, therefore, the accident and safety records for the future baseline assessment are assumed to be the same as those for the baseline assessment.

Parking and loading

8.3.17 There are no committed changes in the car parks or parking restrictions in the Balsall Common and Hampton-in-Arden area and, therefore, the parking facilities and parking restrictions in the future baseline assessment are assumed to be the same as those in the baseline assessment.

Rail

8.3.18 The key station in the area, in terms of the strategic rail network, is Birmingham International Station, but it is located to the north of the Balsall Common and Hampton-in-Arden area and is included in the Birmingham Interchange and Solihull area section within this report. Birmingham International Station is on the West Coast Main Line, which passes through Balsall Common and Hampton-in-Arden area, with Berkswell and Hampton-in-Arden stations served by local rail train services only.

8.3.19 No additional data on growth in demand on local rail services for Berkswell and Hampton-in-Arden stations is available (beyond that for the baseline assessment) and, therefore, with no committed changes in local rail services, these are assumed to be the same as those in the baseline assessment, and based around Berkswell and Hampton-in-Arden stations.

Local bus and coach services

8.3.20 As outlined above, the West Midlands Local Transport Plan (West Midlands LTP3, with a plan period of 2011 - 2026) identifies aspirations to improve public transport accessibility between rural communities and important centres, particularly by considering the role of local buses services, taxibus and Ring & Ride services but does not identify any specific committed measures.

8.3.21 The future baseline therefore assumes existing provision levels as set out on the baseline section of the transport assessment.

Public transport interchanges

8.3.22 There are no substantial public transport interchange facilities in the Balsall Common and Hampton-in-Arden area apart from on-line bus stops and no committed proposals for public transport interchange facilities in the area.

Taxis

8.3.23 There are no committed changes in the arrangements or facilities for taxis in the Balsall Common and Hampton-in-Arden area and, therefore, the taxi arrangements and facilities in the future baseline assessment are assumed to be the same as those in the baseline assessment.

Pedestrians, cyclists and equestrians

8.3.24 There are no committed changes in the facilities for pedestrians, cyclists or equestrians in the Balsall Common and Hampton-in-Arden area and, therefore, the pedestrian, cyclist and equestrian facilities in the future baseline assessment are assumed to be the same as those in the baseline assessment.

Waterways and canals

8.3.25 There are no navigable waterways or canals in the Balsall Common and Hampton-in-Arden area.

Air transport

8.3.26 Birmingham Airport is located to the north of the Balsall Common and Hampton-in-Arden area and is included in the Birmingham Interchange and Solihull area section within this report.

Balsall Common and Hampton-in-Arden (CFA23) Proposed Scheme construction description

8.3.27 This section provides an overview of the construction traffic and transport impacts for the section of the Proposed Scheme that will pass through the Balsall Common and Hampton-in-Arden area.

8.3.28 The construction period for the whole route is programmed for 2017 - 2026. The base year for assessment of construction impacts has been chosen at 2021. The forecast peak construction activities have then been overlaid on 2021, with, as relevant, overlapping activities (in both area of importance and timing) considered in combination.

Construction activities

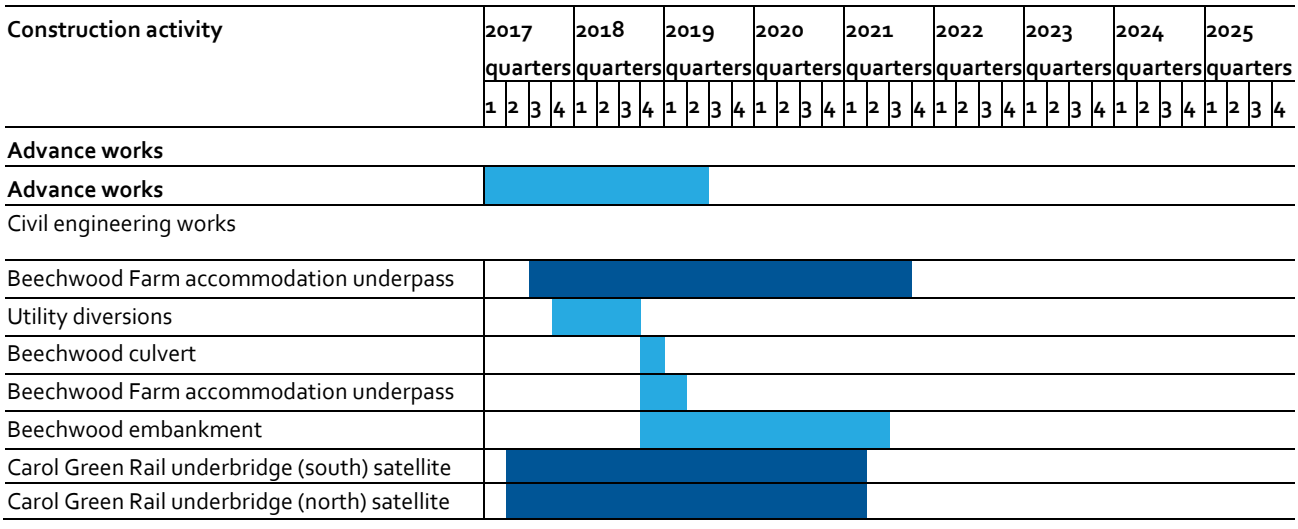
8.3.29 The construction assessment considers the traffic and transport impacts in three peak months of construction activity, based on the proposed phasing of the works. The peak months have been identified as months 22 (2018 Quarter 4), 27 (2019 Quarter 1) and 36 (2019 Quarter 4). In month 22 there will be 10 operational worksites and Lavender Hall Lane will be temporarily closed, in month 27 there will be nine operational worksites, and in month 36 there will be five worksites in operation. The peak months that are assessed include for cumulative impacts arising from construction in the adjoining area as well as for through movements through the area. The peak months also consider any substantial closures that are proposed.

8.3.30 The major construction elements within the Balsall Common and Hampton-in-Arden area have been discussed above but are summarised below along with the expected programme.

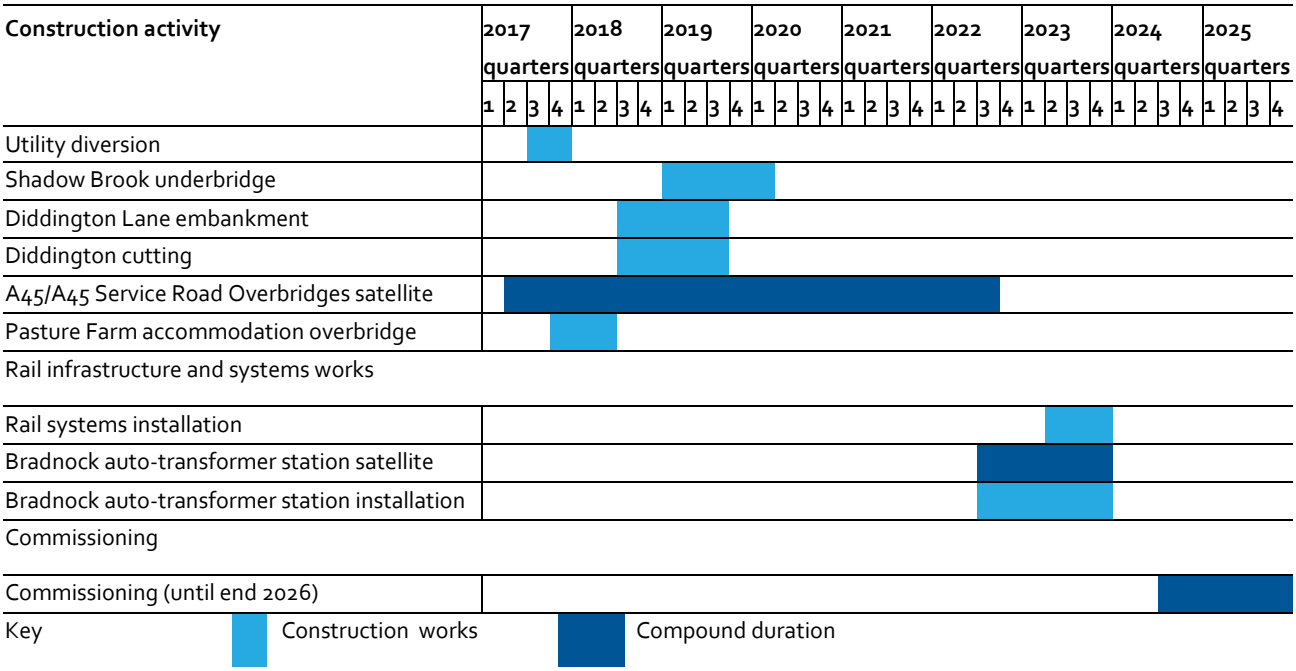
Compounds and construction sites

8.3.31 Details of the construction phasing are provided above and the main construction works and the time periods when each compound is operational are summarised in Figure 8-3.

Figure 8-3: Balsall Common and Hampton-in-Arden (CFA23) construction activity phasing



Construction activity	2017 quarters				2018 quarters				2019 quarters				2020 quarters				2021 quarters				2022 quarters				2023 quarters				2024 quarters				2025 quarters			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Building demolition																																				
Utility diversions																																				
Lanscombe culvert																																				
Truggist Hill culvert																																				
Beechwood embankment																																				
Carol Green rail underbridge																																				
Footpath M191 underpass																																				
Balsall Common viaduct satellite compound																																				
Utility diversions																																				
Footpath M191 accommodation underpass																																				
Balsall Common viaduct																																				
Lavender Hall embankment																																				
Park Lane Cutting main compound																																				
Road construction (temporary roundabout,																																				
Flood alleviation culverts																																				
Utility diversions																																				
Park Lane cutting																																				
Lavender Hall Lane overbridge																																				
Footpath M214 overbridge satellite compound																																				
Footpath M214 overbridge																																				
Footpath M215 overbridge																																				
Bradnock auto-transformer station satellite compound (civil engineering)																																				
Utility diversions																																				
Bradnock auto-transformer station access road																																				
Sixteen Acre Wood embankment																																				
Bradnock auto-transformer station base slab																																				
A452 Kenilworth Road overbridge satellite																																				
Utility diversions																																				
Mercote Hall Lane (Bridleway M218)																																				
A452 Kenilworth Road overbridge																																				
Blythe Bypass embankment																																				
Marsh Farm viaduct																																				
Mercote Hall Lane (Bridleway M218)																																				
Mercote Mill embankment																																				
Patrick cutting																																				
Horn Brook cutting																																				
A452 Kenilworth Road realignment																																				
River Blythe Bypass culvert satellite compound																																				
River Blythe Bypass culvert																																				
B4102 Meriden Road underbridge satellite																																				
Utility diversions																																				
B4102 Meriden Road underbridge																																				
River Blythe viaduct																																				
Patrick embankment																																				
Diddington Lane embankment																																				
Shadow Brook underbridge satellite compound																																				



8.3.32 The location of the construction compounds are shown on Map CT-05-100b to Map CT-05-105a, Volume 2, Map Book 23.

8.3.33 Table 8-18 summarises the anticipated average and peak workforce to be required at each construction compound.

Table 8-18: Assumed workforce at construction sites

Compound type	Location	Assumed daily workforce per site for duration with busy vehicle movements	
		Average	Peak
Satellite	Beechwood Farm accommodation underpass satellite compound	8	11
Satellite	Carol Green rail underbridge (south) satellite compound	23	33
Satellite	Carol Green rail underbridge (north) satellite compound	26	36
Satellite	Balsall Common viaduct satellite compound	60	80
Main	Park Lane cutting main compound	80	100
Satellite	Footpath M214 overbridge satellite compound	8	11
Satellite	Bradnock auto-transformer station satellite compound	8	11
Satellite	A452 Kenilworth Road overbridge satellite compound	60	80
Satellite	River Blythe bypass culvert satellite compound	19	26.5

Compound type	Location	Assumed daily workforce per site for duration with busy vehicle movements	
		Average	Peak
Satellite	B4102 Meriden Road underbridge satellite compound	50	70
Satellite	Shadow Brook underbridge satellite compound	40	55
Satellite	A45/A452 (Stonebridge Island) satellite compound	40	55

8.3.34 Typical vehicle trip generation for construction site compounds in this area are shown in Table 8-19. The duration of when there will be busy transport activity at each site is also shown in Table 8-19. This represents the periods when the construction traffic flows will be greater than 50% of the peak flows. Also shown is the estimated number of daily vehicle trips during the peak month of activity, the lower end of the range shows the average number of trips and the upper end the peak flows.

Table 8-19: Typical vehicle trip generation for construction site compounds in this area

Compound type	Location	Access to/from compound	Indicative start/set up date	Estimated duration of use (years)	Estimated duration with busy vehicle movements (months)	Average daily combined two-way vehicle trips during busy period and within peak month of activity	
						Car/LGV	HGV
Satellite	Beechwood Farm accommodation underpass satellite compound	Kenilworth Greenway off B4101 Waste Lane	Q3 2017	4 years and 3 months	12	10-20	65-66
Satellite	Carol Green Rail underbridge (south) satellite compound	HGV – Kenilworth Greenway off B4101 Waste Lane, LGV/ Car – access off Truggist Lane)	Q2 2017	4	2	20-50	11-11
Satellite	Carol Green Rail underbridge (north) satellite compound	HGV – Park Lane, LGV/ Car – access off Truggist Lane)	Q2 2017	4	2	10-20	<10-<10
Satellite	Balsall Common viaduct satellite compound	HGV – Park Lane, LGV/ Car – access off Lavender Hall Lane)	Q2 2017	2 years and 9 months	3	80-120	18-18

Compound type	Location	Access to/from compound	Indicative start/set up date	Estimated duration of use (years)	Estimated duration with busy vehicle movements (months)	Average daily combined two-way vehicle trips during busy period and within peak month of activity	
						Car/LGV	HGV
Main	Park Lane cutting main compound	Park Lane	Q2 2017	4 years and 3 months as office of which 2 years are compound	3	110-170	92-96
Satellite	Footpath M214 overbridge satellite compound	Park Lane	Q2 2017	1	2	10-20	19-19
Satellite	Bradnock auto-transformer station satellite compound	Kenilworth Road at Bradnocks Marsh Lane Roundabout	Q2 2017	2 years and 3 months	2	10-20	20-20
Satellite	A452 Kenilworth Road overbridge satellite compound	Kenilworth Road north of Marsh Lane	Q2 2017	4 years and 3 months as worker accommodation of which 2 years and 9 months are compound	25	80-120	201-217
Satellite	River Blythe Bypass culver, satellite compound	Kenilworth Road north of Marsh Lane	Q2 2017	1 year and 9 months	4	20-40	13-19
Satellite	B4102 Meriden Road underbridge satellite compound	Diddington Lane	Q2 2017	2	4	10-20	15-18
Satellite	Shadow Brook underbridge satellite compound	Diddington Lane	Q2 2017	3	7	50-80	8-11

Construction lorry routes

8.3.35 The construction lorry routes that will be used to access the above compounds are shown on Maps TR-03-151 to TR-03-153, (Volume 5, Map Book 71).

8.3.36 Access routes to the main compound sites will be via the strategic highway network, although some access locations will be off secondary roads. For the Balsall Common and Hampton-in Arden area, the A452 Kenilworth Road is proposed as the primary HGV route (from the M42 and M6 motorway networks and the A45 Coventry Road) for access to and egress from each of the main site compounds. It is envisaged that HGV traffic will be routed along the A452 Kenilworth Road, Park Lane, Hallmeadow Road, Lavender Hall Road (parts of), Truggist Lane (parts of), Waste Lane, Diddington Lane, with No Entry to Construction Traffic for Old Waste Lane, parts of Lavender Hall Road where it goes back into Balsall Common, Truggist Lane where it crosses the West Coast Main Line, Bradnock's Marsh Lane and parts of Meriden Road into Hampton-in-Arden beyond Diddington Lane.

8.3.37 The following lorry routes are currently proposed for the main construction site compound:

- The proposed lorry route for the Park Lane main compound would be Park Lane leading onto the A452 Kenilworth Road, continuing northwards to Stonebridge Island and then eastwards along the A45 Coventry Road to M42 junction 6.

8.3.38 Satellite construction site compounds would generally be more remote and operational for shorter durations, accessible via internal site access routes and A, B or minor unclassified roads, as described for the main sites above, and with the restriction of No Entry to Construction Traffic as appropriate. Access would include the following routes:

- The proposed lorry route for the Beechwood underbridge satellite compound would be from Waste Lane, eastwards to the A452 Kenilworth Road, continuing northwards to Stonebridge Island and then eastwards along the A45 Coventry Road to M42 junction 6;
- The proposed lorry route for the Carol Green Rail underbridge (south) satellite compound would be from Waste Lane, eastwards to the A452 Kenilworth Road, continuing northwards to Stonebridge Island and then eastwards along the A45 Coventry Road to M42 junction 6;
- The proposed lorry route for the Carol Green Rail underbridge (north) satellite compound would be from Truggist Lane turning right into Spencers Lane, continuing along Balsall Street and turning right into Nailcote Lane. The route would continue along Balsall Street to Waste Lane and Kelsey Lane to join the A452 Kenilworth Road Kenilworth Lane, continuing northwards to Stonebridge Island and then eastwards along the A45 Coventry Road to M42 junction 6;

- The proposed lorry route for the Balsall Common viaduct satellite compound would be from the site access/haul route from Park Lane via the A452 Kenilworth Road, continuing northwards to Stonebridge Island and then eastwards along the A45 Coventry Road to M42 junction 6;
- The proposed lorry route for the Heart of England Way underbridge satellite compound would be from Park Lane via the A452 Kenilworth Road, continuing northwards to Stonebridge Island and then eastwards along the A45 Coventry Road to M42 junction 6;
- The proposed lorry route for the Bradnock autotransformer satellite compound would be from the adjacent roundabout on the A452 Kenilworth Road, continuing northwards to Stonebridge Island and then eastwards along the A45 Coventry Road to M42 junction 6;
- The proposed lorry route for the A452 Kenilworth Road satellite compound would be along the site access/haul route to the A452 Kenilworth Road continuing northwards to Stonebridge Island and then eastwards along the A45 Coventry Road to the M42 junction 6.
- The proposed lorry route for the River Blythe Bypass satellite compound would be from the site access/haul route via the A452 Kenilworth Road, continuing northwards to Stonebridge Island and then eastwards along the A45 Coventry Road to M42 Junction 6. Occasional access would be required from the private road through the adjacent Marsh Lane Nature Reserve; and
- The proposed lorry route for Shadow Brook viaduct satellite compound would be from Diddington Lane via the A452 Kenilworth Road, continuing northwards to Stonebridge Island and then eastwards along the A45 Coventry Road to M42 junction 6.

8.3.39 In addition, a temporary haul route within the land required to construct the scheme (construction boundary) will be provided which will help to mitigate the impact on the wider network by providing a route for the movement of materials, workers and waste.

Traffic management, road closures and diversions

8.3.40 The construction of the Proposed Scheme has been carefully planned to minimise disruption to travellers through any traffic management, road closures and diversions. Where closures are necessary, the general approach is the undertake closures for short discreet periods to ensure that the impact on users is minimised. Table 8-20 summarises the closures that will be required.

Table 8-20: Summary of required road closures

Name	Location	Diversion route	Length of diversion	Duration	Comment
Waste Lane	Ch147+650	N/A	N/A	3 months	To allow formation of construction access requiring intermittent lane restrictions over 3 month period
Truggist Lane	Ch149+200	via Station Road/Waste Lane/Truggist Lane	4.8km	3 months	For piling and beam installation, formwork installation & removal potentially requiring lane restrictions and also 30No overnight closures or 6No weekend closures over deck construction period
Lavender Hall Lane	Ch149+985	Via Park Lane	700m	12 months	To allow new bridge construction
Park Lane	Ch150+600	Relocated Park Lane and Lavender Lane	900m	Permanent	Bisected by HS2 trace
A452 Kenilworth Road	Ch150+800	Local to existing road	300m	3 months	To allow construction and removal of temporary roundabout
Kenilworth Road	Ch153+000	Local to existing road	300m	3 months	To allow tie-in of new road
Kenilworth Road	Ch153+000	Relocated Kenilworth Road	1600m	Permanent	
Meriden Road	Ch154+000	Diddington Lane	1000m	18 months	For piling and beam installation, formwork installation & removal potentially requiring lane restrictions and also 30No overnight closures or 6No weekend closures over construction period

8.3.41 There will be temporary diversions of general traffic in place during overnight closures at a number of locations, including the A452 Kenilworth Road, Truggist Lane and the B4102 Meriden Road. The impact of these off peak closures on traffic flows, and consequently delays to vehicles as a result of diversions or traffic congestion, is not likely to be substantial.

8.3.42 The continuous closure of Lavender Hall Lane will have an impact on flows in the surrounding area and is assessed in the following sections.

8.3.43 Permanent closures are addressed in the operational scheme section of this report.

PRoW closures and diversions

8.3.44 Construction of the Proposed Scheme will also require temporary closure and diversion of some PRoW which cross or are affected during the construction period. In order to minimise the disruption to users, closures and diversion have been carefully planned to ensure that wherever possible either the existing or alternative route will be maintained at all times. Table 8-21 summarises the temporary closures and/or diversions that will be required.

Table 8-21: Construction phase impact on PRoW

Name	Location	Length of diversion	Alternative route	Duration	Comment
Kenilworth Greenway (see CT-05-101, Volume 2, Map Book 23)	Ch147+900 to Ch149+040 80m south east of HS2 centre line	1520m	Diversion approx. 80m to south east of Greenway around stockpiles and balancing ponds	51 months	Kenilworth Greenway to be reinstated back on existing alignment upon completion of construction. Temporary diversion connects to FP M191 and then M196 to connect to Truggist Lane
FP M191 (see CT-05-101, Volume 2, Map Book 23)	Ch148+680	1297m	FP M196 + Truggist Lane	42 months	Required for construction of M191 underpass
FP M192 (see CT-05-101, Volume 2, Map Book 23)	Ch148+900	1040m	FP M196 + Truggist Lane	42 months	Required for construction of M191 underpass
FP M197 (see CT-05-099, Volume 2, Map Book 18)	Ch148+470	1065m	Baulk Lane + Truggist + FP M196	42 months	Pedestrians routed away from the construction area for Balsall common viaduct
FP M191 (see CT-05-101, Volume 2, Map Book 23)	Ch149+560	1090m	Baulk Lane + Truggist + FP M196	42 months	Necessary to move pedestrians out of the construction area for Balsall common viaduct
FP M196 (see CT-05-101, Volume 2, Map Book 23)	Ch149+750	420m	Perimeter of utilities site	36 months	Water utilities connections will take place in this location.
FP M214 (see CT-05-101, Volume 2, Map Book 23)	Ch150+600	482m	Park Lane + perimeter of site	36 months	Route to keep pedestrian away from the haul road and M214 overbridge works.

Name	Location	Length of diversion	Alternative route	Duration	Comment
FP M215, FP M216 (see CT-05-101, Volume 2, Map Book 23)	Ch151+400	2341m	FP M215+ site perimeter + Park Lane +A452 Kenilworth Rd + FP M215	36 months	Route to keep pedestrian away from the haul road and M215 overbridge works.
FP M217 (see CT-05-103, Volume 2, Map Book 23)	Ch148+750	820m	Perimeter of utilities site	36 months	Diverted for utility installation
FP M218 (see CT-05-103, Volume 2, Map Book 23)	Ch152+785	605m	Dedicated diversion across site haul road at Ch152+850	50 months	The bridleway is on the line of the new structure. The division will allow the structure to be constructed off line.
FP M230A (see CT-05-103, Volume 2, Map Book 23)	Ch153+720	140m	Perimeter of pond/outfall site	6 months	Temporary realignment for balancing pond outfall woks
FP M114 (see CT-05-105a, Volume 2, Map Book 23)	Ch148+750	355m	Diddington Lane + Pasture Farm accommodation access	6 months	Diverted for utility works, Western Power overhead lines, a temporary realignment of Footpath M114 for approximately 350m via Diddington Lane and Pasture Farm private access, adding an additional 50m

*Note - length quoted above is the length of the new section of PRoW and not the distance change for users

8.3.45 There will be temporary alternative routes for 12 PRoW and the Kenilworth Greenway. Non-motorised users of Lavender Hall Lane will also be re-routed due to the 12 month closure.

Avoidance and mitigation impacts

8.3.46 The engineering and construction design has been conceived as such to minimise the impacts during construction. The following measures have been included as part of the engineering design of the Proposed Scheme and will avoid or reduce impacts on transport users:

- Restricting road closures to overnights and weekends (where reasonably practicable) including off peak (short term overnight and weekend road closures) on Truggist Lane with diversion via Station Road/Waste Lane/Truggist Lane, Kenilworth Road to allow for tie-in of relocated Kenilworth Road and Meriden Road with diversion via Diddington Lane;

- Construction materials and equipment will be transported along the haul road adjacent to the Proposed Scheme alignment where possible to reduce lorry movements on the public highway;
- Lorry routes for construction equipment and materials will be defined to ensure only the most suitable roads are used. HGV routing as far as possible along the strategic road network;
- construction materials and equipment will be transported along a haul road adjacent to the Proposed Scheme alignment where possible to reduce lorry movements on the public highway;
- the majority of roads crossing the Proposed Scheme will be kept open during construction resulting in minimal substantial diversions of traffic onto alternative routes;
- offline construction of new road infrastructure on the Kenilworth Road and Park Lane;
- temporary diversion of 13 PRoW (footpath/bridleway);
- Surplus spoil material will be reused wherever possible along the alignment of the Proposed Scheme which will reduce lorry movements on the public highway; and
- On-site accommodation for site workers and on site welfare facilities to reduce daily travel by site workers.

8.3.47 The measures in the draft CoCP (see Volume 5: Appendix CT-003-000/1) will seek to reduce deliveries of construction materials and equipment, thus minimising construction lorry trip generation, especially during peak traffic periods. The draft CoCP will include HGV management and control measures.

8.3.48 The measures in the draft CoCP will include clear controls on vehicle types, hours of site operation, and routes for heavy goods vehicles, to reduce the impact of road based construction traffic. In order to achieve this, generic and site specific traffic management measures will be implemented during the construction of the project on or adjacent to public roads, bridleways, footpaths and other PRoW affected by the Proposed Scheme as necessary.

8.3.49 Where reasonably practicable, the number of private car trips to and from the site (both workforce and visitors) will be reduced by encouraging alternative modes of transport or vehicle sharing. A framework construction workers travel plan will be produced by each principal contractor and presented to the local highway authority which will aim to encourage the use of sustainable modes of transport and reduce the impact of workforce traffic on the highway network.

Balsall Common and Hampton-in-Arden (CFA23) assessment of construction impacts

Key construction transport issues

8.3.50 Construction of the Proposed Scheme in the Balsall Common and Hampton-in-Arden area will have a number of temporary impacts. These temporary impacts will include increased traffic demand on a number of roads, associated with the construction works and workers accessing construction sites and compounds, and the temporary closure of roads and/or footpaths, requiring diversion routes for users. The following sections consider these impacts in detail.

8.3.51 There will be temporary alternative routes for 12 PRoW and the Kenilworth Greenway. Non-motorised users of Lavender Hall Lane will also be re-routed due to the 12 month closure

Strategic and local road network traffic flows

8.3.52 During the construction period there will be a number of roads within the strategic network that will be affected by the construction of the Proposed Scheme through the area. An assessment of the impact of construction related vehicle movements as well as any substantial closures has been undertaken and is detailed below. In the assessments that follow, the flows presented are for the worst case scenario based on the range of alternatives that have been tested. The flows outlined in the following sections will not necessarily occur concurrently as impacts in different parts of the network will occur at different times.

8.3.53 Table 8-22 shows a summary of the 2021 future baseline flows for the A452 Kenilworth Road together with the Proposed Scheme construction traffic flows on links where there is expected to be additional traffic associated with the construction of the Proposed Scheme in the AM peak hour (08:00-09:00). The table draws on information for the construction assessment months and shows the worst case flows in any given location irrespective of the month in which the flow occurs. The table therefore provides a robust assessment.

Table 8-22: Strategic road network AM peak hour (08:00-09:00) traffic flows 2021 future baseline and with the Proposed Scheme construction traffic (vehicles)

Location	Direction	AM peak (08:00-09:00)							
		2021 baseline (veh)		2021 baseline with HS2 construction traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With the Proposed Scheme
A452 Kenilworth Road (between	NB	1,036	18	1,044	26	0.8%	43.3%	28.8%	29.0%

Location	Direction	AM peak (08:00-09:00)							
		2021 baseline (veh)		2021 baseline with HS2 construction traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With the Proposed Scheme
Wootton Lane and Hallmeadow Road)	SB	828	15	854	25	3.2%	73.6%	46.0%	47.5%
A452 Kenilworth Road (between Windmill Lane and Meer End Road)	NB	876	16	876	16	0.0%	0.0%	55.1%	55.1%
	SB	837	15	837	15	0.0%	0.0%	52.6%	52.6%
A452 Kenilworth Road (between Meriden Lane and Marsh Lane)	NB	1,121	20	1,143	42	2.0%	110.0%	31.1%	31.8%
	SB	900	16	922	38	2.4%	137.0%	25.0%	25.6%
A452 Kenilworth Road (between Station Road and Gypsy Lane)	NB	901	16	909	24	0.9%	49.8%	58.2%	58.7%
	SB	804	14	815	25	1.3%	75.8%	51.9%	52.6%
A452 Kenilworth Road (south of Stonebridge Roundabout)	NB	1,165	54	1,200	90	3.1%	66.0%	32.4%	33.3%
	SB	1,382	64	1,418	100	2.6%	55.6%	38.4%	39.4%
A452 Kenilworth Road (between Lavender Hall Lane and Station Road)	NB	978	17	986	25	0.8%	45.9%	63.1%	63.6%
	SB	886	16	897	26	1.2%	68.8%	57.2%	57.8%
A452 Kenilworth Road (between Wootton Green Lane and Lavender	NB	908	16	964	24	6.2%	49.4%	58.6%	62.2%
	SB	756	13	831	24	9.9%	80.6%	48.8%	53.6%

Location	Direction	AM peak (08:00-09:00)							
		2021 baseline (veh)		2021 baseline with HS2 construction traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With the Proposed Scheme
Hall Lane)									
A452 Kenilworth Road (between Hallmeadow Road and Wootton Green Lane)	NB	911	16	968	24	6.2%	49.2%	58.8%	62.4%
	SB	734	13	809	24	10.2%	83.0%	47.4%	52.2%
A452 Kenilworth Road (between Park Lane and Wootton Lane)	NB	993	18	1,001	26	0.8%	45.2%	27.6%	27.8%
	SB	837	15	863	26	3.2%	72.8%	23.2%	24.0%
A452 Kenilworth Road (between Bradnocks Marsh Lane and Park Lane)	NB	1,009	18	1,026	35	1.7%	97.7%	28.0%	28.5%
	SB	859	15	877	33	2.0%	114.7%	23.9%	24.3%
A452 Kenilworth Road (between Bradnocks Marsh Lane and Marsh Lane)	NB	1,112	20	1,134	42	2.0%	110.9%	30.9%	31.5%
	SB	897	16	919	38	2.4%	137.5%	24.9%	25.5%
A452 Kenilworth Road (between Windmill Lane and Kelsey Lane)	NB	718	13	718	13	0.0%	0.0%	45.2%	45.2%
	SB	667	12	667	12	0.0%	0.0%	42.0%	42.0%
A452 Kenilworth Road (between Gypsy Lane and Adler Lane)	NB	672	12	680	20	1.2%	66.8%	42.2%	42.7%
	SB	712	13	723	23	1.5%	85.6%	44.8%	45.4%

Location	Direction	AM peak (08:00-09:00)							
		2021 baseline (veh)		2021 baseline with HS2 construction traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With the Proposed Scheme
A452 Kenilworth Road (between Meriden Road and Diddington Lane)	NB	1,090	51	1,090	51	0.0%	0.0%	30.3%	30.3%
	SB	1,334	62	1,370	97	2.7%	57.3%	37.1%	38.1%
A452 Kenilworth Road (south of Meer End Road)	NB	571	10	571	10	0.0%	0.0%	35.9%	35.9%
	SB	494	9	494	9	0.0%	0.0%	31.1%	31.1%

8.3.54 Table 8-22 above clearly shows that construction traffic will not create any capacity related issues on strategic routes within the area. Where flows are forecast to increase, the roads are all well within capacity (all V/C ratios less than 85%) and where additional trips are as a result of HGV movements, in no location is the increase greater than one vehicle per minute.

8.3.55 Table 8-23 shows a summary of the 2021 future baseline flows for the A452 Kenilworth Road together with the Proposed Scheme construction traffic flows on links where there is expected to be additional traffic associated with the construction of the Proposed Scheme in the PM peak hour (17:00-18:00). Table 8-23 draws on information for the construction assessment months and shows the worst case flows in any given location irrespective of the month in which the flow occurs. The table therefore provides a robust assessment.

Table 8-23: Strategic road network PM (17:00-18:00) peak hour traffic flows 2021 future baseline and with the Proposed Scheme construction traffic (vehicles)

Location	Direction	PM peak (17:00-18:00)							
		2021 baseline (veh)		2021 baseline with the Proposed Scheme construction traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With the Proposed Scheme
A452 Kenilworth Road (between Wootton Lane and Hallmeadow	NB	937	16	945	24	0.9%	48.5%	26.0%	26.2%
	SB	1,154	20	1,172	31	1.6%	53.4%	64.1%	65.1%

Location	Direction	PM peak (17:00-18:00)							
		2021 baseline (veh)		2021 baseline with the Proposed Scheme construction traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With the Proposed Scheme
Road)									
A452 Kenilworth Road (between Windmill Lane and Meer End Road)	NB	992	17	992	17	0.0%	0.0%	62.4%	62.4%
	SB	933	16	933	16	0.0%	0.0%	58.7%	58.7%
A452 Kenilworth Road (between Meriden Lane and Marsh Lane)	NB	992	17	1,013	39	2.2%	125.9%	27.5%	28.1%
	SB	1,340	23	1,362	45	1.6%	93.1%	37.2%	37.8%
A452 Kenilworth Road (between Station Road and Gypsy Lane)	NB	973	17	981	25	0.8%	46.7%	62.8%	63.3%
	SB	854	15	865	26	1.3%	72.2%	55.1%	55.8%
A452 Kenilworth Road (south of Stonebridge Roundabout)	NB	1,344	68	1,380	104	2.7%	52.5%	37.3%	38.3%
	SB	1,604	81	1,639	117	2.2%	44.0%	44.5%	45.5%
A452 Kenilworth Road (between Lavender Hall Lane and Station Road)	NB	895	16	903	24	0.9%	50.7%	57.8%	58.3%
	SB	1,115	20	1,126	30	1.0%	55.3%	71.9%	72.6%
A452 Kenilworth Road (between Wootton Green Lane and Lavender Hall Lane)	NB	815	14	859	22	5.4%	55.7%	52.6%	55.4%
	SB	1,032	18	1,086	29	5.3%	59.7%	66.6%	70.1%
A452 Kenilworth Road (between	NB	811	14	855	22	5.5%	56.0%	52.3%	55.2%

Location	Direction	PM peak (17:00-18:00)							
		2021 baseline (veh)		2021 baseline with the Proposed Scheme construction traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With the Proposed Scheme
Hallmeadow Road and Wootton Green Lane)	SB	1,032	18	1,086	29	5.3%	59.7%	66.6%	70.1%
A452 Kenilworth Road (between Park Lane and Wootton Lane)	NB	903	16	910	24	0.9%	50.3%	25.1%	25.3%
	SB	1,139	20	1,157	31	1.6%	54.1%	31.6%	32.1%
A452 Kenilworth Road (between Bradnocks Marsh Lane and Park Lane)	NB	923	16	941	34	1.9%	108.0%	25.6%	26.1%
	SB	1,132	20	1,149	37	1.5%	88.1%	31.4%	31.9%
A452 Kenilworth Road (between Bradnocks Marsh Lane and Marsh Lane)	NB	992	17	1,013	39	2.2%	125.9%	27.5%	28.1%
	SB	1,306	23	1,328	45	1.7%	95.6%	36.3%	36.9%
A452 Kenilworth Road (between Windmill Lane and Kelsey Lane)	NB	851	15	851	15	0.0%	0.0%	53.5%	53.5%
	SB	766	13	766	13	0.0%	0.0%	48.2%	48.2%
A452 Kenilworth Road (between Gypsy Lane and Adler Lane)	NB	749	13	757	21	1.1%	60.6%	47.1%	47.6%
	SB	849	15	860	26	1.3%	72.6%	53.4%	54.1%
A452 Kenilworth Road (between Meriden Road and Diddington Lane)	NB	1,194	60	1,194	60	0.0%	0.0%	33.2%	33.2%
	SB	1,576	80	1,611	115	2.3%	44.5%	43.8%	44.8%
A452 Kenilworth	NB	512	9	512	9	0.0%	0.0%	32.2%	32.2%

Location	Direction	PM peak (17:00-18:00)							
		2021 baseline (veh)		2021 baseline with the Proposed Scheme construction traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With the Proposed Scheme
Road (south of Meer End Road)	SB	610	11	610	11	0.0%	0.0%	38.4%	38.4%

8.3.56 As with the AM peak hour (08:00-09:00), the table above shows that construction traffic will not create any capacity related issues on strategic routes within the area. Where flows are forecast to increase, the roads are all well within capacity (all V/C ratios less than 85%) and where additional trips are as a result of HGV movements, in no location is the increase greater than one vehicle per minute.

8.3.57 Table 8-24 shows a summary of the 2021 future baseline for the local road network together with the Proposed Scheme construction traffic flows on links where there is expected to be an impact in the AM peak hour (08:00-09:00). Table 8-24 draws on information for the construction assessment months and shows the worst case flows in any given location irrespective of the month in which the flow occurs. The table therefore provides a robust assessment.

Table 8-24: Local road network AM peak hour (08:00-09:00) traffic flows 2021 future baseline and with the Proposed Scheme construction traffic (vehicles)

Location	Direction	AM peak (08:00-09:00)							
		2021 baseline (veh)		2021 baseline with the Proposed Scheme construction traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Base	With the Proposed Scheme
Windmill Lane between Hob Lane and Kenilworth Road	NB	185	1	185	1	0.0%	0.0%	24.7%	24.7%
	SB	148	1	148	1	0.0%	0.0%	19.7%	19.7%
Windmill Lane between Hob Lane and Kelsey Lane	NB	122	0	126	4	3.0%	N/A	16.3%	16.8%
	SB	155	1	159	4	2.4%	653.2%	20.7%	21.2%
Hob Lane	EB	122	0	126	4	3.0%	N/A	16.3%	16.8%
	WB	47	0	51	4	7.9%	N/A	6.3%	6.8%

Location	Direction	AM peak (08:00-09:00)							
		2021 baseline (veh)		2021 baseline with the Proposed Scheme construction traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Base	With the Proposed Scheme
Kelsey Lane between Kenilworth Road and Meeting House Lane	EB	372	2	382	13	2.9%	516.6%	33.5%	34.5%
	WB	259	1	267	9	3.1%	552.7%	23.4%	24.1%
Waste Lane	EB	461	3	468	9	1.5%	270.9%	41.5%	42.1%
	WB	299	2	303	6	1.4%	256.3%	26.9%	27.3%
Lavender Hall Lane between A452 Kenilworth Road and Hallmeadow Road	EB	100	0	100	0	0.0%	0.0%	13.3%	13.3%
	WB	114	0	114	0	0.0%	0.0%	15.1%	15.1%
Lavender Hall Lane between Hallmeadow Road and Park Lane	EB	145	1	145	1	0.0%	0.0%	19.3%	19.3%
	WB	200	1	200	1	0.0%	0.0%	26.7%	26.7%
Lavender Hall Lane between Park Lane and Spencer's Lane	EB	178	1	178	1	0.0%	0.0%	23.7%	23.7%
	WB	200	1	200	1	0.0%	0.0%	26.7%	26.7%
Hallmeadow Road between Lavender Hall Lane and A452 Kenilworth Road	EB	97	0	97	0	0.0%	0.0%	8.6%	8.6%
	WB	130	0	130	0	0.0%	0.0%	11.4%	11.4%
Park Lane	EB	42	0	141	7	236.3%	N/A	5.6%	18.7%
	WB	2	0	138	7	6341.5%	N/A	0.3%	18.4%
Meriden Road between A452 Kenilworth Road and Diddington Lane	EB	511	3	511	2	0.0%	-43.8%	46.0%	46.0%
	WB	548	3	548	2	0.0%	-43.8%	49.4%	49.4%
Meriden Road west of Diddington Lane	EB	726	4	726	2	0.0%	-43.8%	65.4%	65.4%
	WB	557	3	557	2	0.0%	-43.8%	50.2%	50.2%
Diddington Lane at Meriden Road	NB	224	1	224	0	0.0%	-43.8%	29.9%	29.9%
	SB	18	0	18	0	0.0%	N/A	2.4%	2.4%

Location	Direction	AM peak (08:00-09:00)							
		2021 baseline (veh)		2021 baseline with the Proposed Scheme construction traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Base	With the Proposed Scheme
Diddington Lane at A452 Kenilworth Road	EB	196	1	197	2	0.8%	184.0%	26.1%	26.3%
	WB	41	0	43	2	4.3%	1130.8%	5.5%	5.7%
Hampton Lane east of A452 Kenilworth Road	EB	634	4	634	2	0.0%	-43.8%	57.1%	57.1%
	WB	573	3	573	2	0.0%	-43.8%	51.6%	51.6%
Spencer Lane between Coventry Road and Baulk Lane	NB	152	1	200	1	31.7%	0.0%	20.3%	26.7%
	SB	361	1	428	1	18.5%	0.0%	48.1%	57.0%
Spencer Lane between Baulk Lane and Truggist Lane	NB	136	0	184	0	35.4%	0.0%	18.1%	24.6%
	SB	356	1	422	1	18.8%	0.0%	47.4%	56.3%

8.3.58 Table 8-24 above clearly shows that construction traffic will not create any capacity related issues on local routes within the area. Where flows are forecast to increase, the roads are all well within capacity (all V/C ratios less than 85%). Where the percentage increase is shown to be large, this is consequence of the low background flows. This is particularly evident when considering HGV movements where there are some substantial percentage increases however in no location is the peak hour impact expected to result in an additional HGV movement by more than every five minutes. This is therefore not considered to be substantial.

8.3.59 It should also be noted that Table 8-24 shows a substantial increase in traffic on Park Lane. This increase is largely related to the closure of Lavender Hall Lane for a period of 12 months which is to reconstruct Lavender Hall Lane to accommodate the Proposed Scheme. The closure of Lavender Hall Lane will result in vehicle trips using alternative routes with additional travel distance of up to 1.1km. Whist flows do increase on surrounding roads, the increases are not expected to have a substantial impact.

8.3.60 Table 8-25 shows a summary of the 2021 future baseline for the local road network together with the Proposed Scheme construction traffic flows on links where there is expected to be an impact in the PM peak hour (17:00-18:00) . Table 8-25 draws on information for the construction assessment months and shows the worst case flows in any given location irrespective of the month in which the flow occurs. The table therefore provides a robust assessment.

Table 8-25: Local road network PM peak hour (17:00-18:00) traffic flows 2021 future baseline and with the Proposed Scheme Construction traffic (vehicles)

Location	Direction	PM peak (17:00-18:00)							
		2021 baseline (veh)		2021 baseline with the Proposed Scheme construction traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Base	With the Proposed Scheme
Windmill Lane between Hob Lane and Kenilworth Road	NB	165	1	165	12	0.0%	941.3%	22.0%	22.0%
	SB	145	1	145	10	0.0%	941.3%	19.4%	19.4%
Windmill Lane between Hob Lane and Kelsey Lane	NB	179	1	182	17	2.1%	1242.1%	23.8%	24.3%
	SB	98	1	102	11	3.8%	1487.4%	13.1%	13.6%
Hob Lane	EB	43	0	46	7	8.6%	N/A	5.7%	6.2%
	WB	109	1	113	12	3.4%	1433.9%	14.5%	15.0%
Kelsey Lane between Kenilworth Road and Meeting House Lane	EB	201	1	212	25	5.4%	1833.9%	18.1%	19.1%
	WB	354	2	362	33	2.2%	1350.8%	31.9%	32.6%
Waste Lane	EB	277	2	284	27	2.6%	1399.6%	25.0%	25.6%
	WB	381	2	385	31	1.1%	1176.1%	34.3%	34.7%
Lavender Hall Lane between A452 Kenilworth Road and Hallmeadow Road	EB	92	1	92	7	0.0%	941.3%	12.3%	12.3%
	WB	83	1	83	6	0.0%	941.3%	11.1%	11.1%
Lavender Hall Lane between Hallmeadow Road and Park Lane	EB	109	1	109	8	0.0%	941.3%	14.5%	14.5%
	WB	140	1	140	10	0.0%	941.3%	18.7%	18.7%
Lavender Hall Lane between Park Lane and Spencer's Lane	EB	138	1	138	10	0.0%	941.3%	18.4%	18.4%
	WB	141	1	141	10	0.0%	941.3%	18.8%	18.8%

Location	Direction	PM peak (17:00-18:00)							
		2021 baseline (veh)		2021 baseline with the Proposed Scheme construction traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Base	With the Proposed Scheme
Hallmeadow Road between Lavender Hall Lane and A452 Kenilworth Road	EB	95	1	95	7	0.0%	941.3%	8.4%	8.4%
	WB	116	1	116	8	0.0%	941.3%	10.1%	10.1%
Park Lane	EB	35	0	110	9	212.6%	N/A	4.7%	14.7%
	WB	4	0	100	7	2237.5%	N/A	0.6%	13.3%
Meriden Road between A452 Kenilworth Road and Diddington Lane	EB	440	3	440	86	0.0%	2928.1%	39.6%	39.6%
	WB	414	3	414	81	0.0%	2928.1%	37.3%	37.3%
Meriden Road west of Diddington Lane	EB	551	4	551	108	0.0%	2928.1%	49.6%	49.6%
	WB	447	3	447	87	0.0%	2928.1%	40.3%	40.3%
Diddington Lane at Meriden Road	NB	149	1	121	1	-19.0%	-19.0%	19.9%	16.1%
	SB	28	0	23	0	-19.0%	N/A	3.8%	3.1%
Diddington Lane at A452 Kenilworth Road	EB	168	1	170	35	1.0%	2887.8%	22.4%	22.6%
	WB	10	0	12	4	17.7%	N/A	1.3%	1.6%
Hampton Lane east of A452 Kenilworth Road	EB	625	4	625	122	0.0%	2928.1%	56.3%	56.3%
	WB	498	3	498	97	0.0%	2928.1%	44.8%	44.8%
Spencer Lane between Coventry Road and Baulk Lane	NB	315	1	351	1	11.6%	0.0%	41.9%	46.8%
	SB	121	0	168	0	38.6%	0.0%	16.1%	22.3%
Spencer Lane between Baulk Lane and Truggist Lane	NB	309	1	346	1	11.8%	0.0%	41.2%	46.1%
	SB	114	0	161	0	40.8%	0.0%	15.3%	21.5%

8.3.61 As with the AM peak hour (08:00-09:00), the table above shows that construction traffic will not create any capacity related issues on local routes within the area. Where flows are forecast to increase, the roads are all well within capacity (all V/C ratios less than 85%) and where additional trips are as a result of HGV movements, in no location is the increase greater than one vehicle per minute.

8.3.62 With regard to HGV construction traffic, no individual road will experience an increase of more than 200 vehicle movements a day (two-way) with the maximum expected level of additional HGVs expected to be 187 vehicle movements a day (two-way) on Kelsey Lane/Waste Lane. In overall terms, Kelsey Lane/Waste Lane operates well within its capacity and this additional traffic will not lead to any substantial additional capacity problems. The increase also represents the worst case scenario during construction and whilst construction activity associated with the compounds associated with Beachwood underbridge and Carol Green Rail underbridge (south) compounds is expected to continue for up to 4 years, the busy period of HGV activity is not expected to last more than 12-months as shown in the table above.

8.3.63 Similarly, the next most substantial level of construction traffic will be on Park Lane with additional HGVs expected to be 133 vehicle movements a day (two-way). The Park Lane Compound will be active for a period of 2 years with the busy period HGV of activity is not expected to last more than 2-months.

Accidents and safety

8.3.64 The baseline safety assessment identified no locations at which there have been nine or more accidents over the last three year period and there are no safety analyses and reports for the future baseline assessment.

8.3.65 Whist increases in traffic have the potential to result in an increase in accidents, it is not expected that there will be any substantial traffic related safety related issues during construction.

Rail

8.3.66 The construction of the Carol Green underbridge, close to Berkswell Station, Balsall Common will require interface with Network Rail in relation to the safe operation of the existing railway. Works will typically be carried out in non-disruptive possessions and where this is not possible, possessions and blockades will be agreed through close working with Network Rail to ensure that disruption is minimised.

8.3.67 All rail possessions are expected to be overnight and not therefore disrupt the travelling public.

8.3.68 Rail possessions in adjacent areas also have the potential to disrupt travellers in the area. It is understood that generally possessions in adjoining areas would be limited in nature by duration and timeframe to generally weekend and overnight possessions to minimise the impact on rail travellers. Rail replacement services would be provided as necessary when rail possessions were in place.

8.3.69 The impact in the Balsall Common and Hampton-in-Arden area on strategic rail trips and on the local rail network, in terms of the construction of the Proposed Scheme, will not have a substantial impact.

8.3.70 Users of Berkswell and Hampton-in-Arden stations will similarly not experience disruption since the impact of the closures will be managed to ensure that any disruption is planned for weekend, off-peak and overnight possessions.

Local bus and coach

8.3.71 In the Balsall Common and Hampton-in-Arden area, the impact of construction of the Proposed Scheme on local bus services will be concentrated in the Balsall Common area and in particular:

- Service Number 82 (Heart Of England School - Pickford Green);
- Service Number 83 (Solihull - Meriden via Balsall Common, Berkswell); and
- Service Number 84 (Solihull - Kenilworth via Balsall Common).

8.3.72 These services will be affected by the re-construction of the Lavender Hall Lane Overbridge. The Lavender Hall Lane Overbridge necessitates the closure of Lavender Hall Lane between Park Lane and Hallmeadow Road, for a period of 12months, during which period these services will need to be diverted/re-routed with the likely alternative route via Park Lane.

8.3.73 It should be noted that it is proposed to maintain a continuous link between Lavender Hall Lane and A452 Kenilworth Road either via the existing alignment of Park Lane or the re-aligned Park Lane at all times. Table 8-26 shows the impact on the above services during the 12-month period for which diversions will be required.

Table 8-26: Impact of the Proposed Scheme on bus services

	Service frequency						
Bus service	AM peak (08:00-09:00)	PM peak (17:00-18:00)	Daily	Saturday	Sunday	Diversion length (m)	Change in journey time (mins)
82	1	1	2	0	0	1750	1.9
83	0	0	5	0	0	680	1.3
84	0	0	2	0	0	680	1.0

8.3.74 Table 8-26 above shows that the biggest impact will be on Bus Service 82 with a maximum diversion of 1750m or approximately an additional 2 minutes in travel time. This is not expected to have a substantial impact on bus passengers or total journey times.

8.3.75 Services on Station Road, Truggist Lane and Meriden Road will also be affected by the need for overnight and weekend closures to Truggist Lane and Meriden Road. There are no overnight services in the area and any weekend closures will be short term and therefore the impact is not substantial.

8.3.76 There are no long distance coach services in the Balsall Common and Hampton-in-Arden area and, therefore, no construction activity impacts on long distance coach services in the Balsall Common and Hampton-in-Arden area.

Public transport interchanges

8.3.77 There are no substantial public transport interchange facilities in the Balsall Common and Hampton-in-Arden area and, therefore, no construction activity impacts on public transport interchange facilities in the Balsall Common and Hampton-in-Arden area.

8.3.78 Access to the Beechwood Underpass Satellite Compound and the Carol Green Rail Bridge (South) Satellite Compound may require temporary disruption to access to Berkswell Rail Station car park. Any disruption is short-term and will not have any substantial impact on the operation of the station or car park itself.

Taxis

8.3.79 There are no construction activity impacts on taxis in the Balsall Common and Hampton-in-Arden area, other than temporary changes to the highway network during construction which may affect taxi journey routes when responding to or conveying customers.

Pedestrians, cyclists and equestrians

8.3.80 The need to disrupt existing PRoW and roads to enable construction has been discussed above. This section considers the impact on non-motorised users during construction as a result of temporary disruption to PRoW or roads.

8.3.81 It should be noted that during construction of the Proposed Scheme, it is expected that connectivity for vulnerable users will be maintained either via existing connections or the alternative routes that have been identified. This section seeks to consider the impact on vulnerable users of any temporary changes.

8.3.82 Table 8-27 summarises the change in distance which users experience as a result of disruption to a PRoW or roadside footway in the area.

Table 8-27: Impact on vulnerable users as a result of construction of the Proposed Scheme

Location	Distance change (m)	Journey time change (min)	Number affected (per day)
M191 off Truggist Lane, near Truggist Hill Farm where crosses dismantled Railway	730	8.7	8
M192 off Truggist Lane, where crosses dismantled Railway near existing railway line	380	4.5	9
Truggist Lane	0	0.0	162

Location	Distance change (m)	Journey time change (min)	Number affected (per day)
M196/M197 off Truggist Lane, where right of way meets the rights of way from Lavender Hall Farm and Baulk Lane	960	11.4	5
M196/M191 off Baulk Lane, where right of way meets the right of way from Lavender Hall Farm	600	7.1	2
M196 off Lavender Hall Lane, to the east of Lavender Hall Farm	330	3.9	2
M196 off Lavender Hall Lane, to the north of Lavender Hall Farm	0	0.0	2
Lavender Hall Lane	1350	16.1	3
Park Lane	0	0.0	23
M214 off Park Lane	280	3.3	6
M215 off the A452, east of Holly Acre Lodge	1570	18.7	4
M216 off the A452 near Sixteen Acre Wood	770	9.2	32
M217 off the A452 near Marsh Farm	170	2.0	36
Public Right of Way M216 (near Marsh Farm)	0	0.0	10
M218 Private Road/ Bridleway off A452 opposite Marsh Lane	90	1.1	12
A452 (Kenilworth Road)	0	0.0	3
Footpath off A452 (Kenilworth Road)	0	0.0	19
M230A off Meriden Road, south of Patrick Farm	70	0.8	18
Public Right of Way M114 (off service road on A45 east of Stonebridge)	150	1.8	0
Meriden Road	0	0.0	110
Public Right of Way M118 (off Meriden Road)	0	0.0	2
Public Right of Way M115 (off Diddington Lane)	0	0.0	1
Diddington Lane	0	0.0	2
Kenilworth Greenway	100	1.2	192

8.3.83 The table above shows that the most substantial impact is on users of PRoW FP M215 east of Holly Acre Lodge which is diverted via Park Lane and the A452 Kenilworth Road to enable the construction of the Proposed Scheme including the new footbridge to carry FP M215 over the Proposed Scheme. Whilst the change in distance is over 1.5km in length, diversion is temporary and the overall impact is not expected to be substantial due to the low level of users on this route.

8.3.84 There are no specific construction activity impacts on cycling facilities in the Balsall Common and Hampton-in-Arden area, other than where they affect PRoWs and/or road diversions or where there is additional temporary traffic associated with construction, which is identified above.

8.3.85 There are no construction activity impacts on equestrians in the Balsall Common and Hampton-in-Arden area, other than where they affect PRoWs and/or road diversions, which are identified above.

Waterways and canals

8.3.86 There are no navigable waterways or canals in the Balsall Common and Hampton-in-Arden area and, therefore, no construction activity impacts on navigable waterways and canals in the Balsall Common and Hampton-in-Arden area.

Parking

8.3.87 There are no specific construction activity impacts on the car parks or parking restrictions in the Balsall Common and Hampton-in-Arden area.

Air transport

8.3.88 Birmingham Airport is located to the north of the Balsall Common and Hampton-in-Arden area and is included in the Birmingham Interchange and Solihull area section within this report. There are no construction activity impacts on air transport in the Balsall Common and Hampton-in-Arden area, although users of Birmingham Airport may need to allow more time to access the Airport via the A452 Kenilworth Road during construction of the Proposed Scheme.

Balsall Common and Hampton-in-Arden (CFA23) Proposed Scheme operation description

Operation trip assumptions

8.3.89 The demand for travel generated by the Proposed Scheme has been considered in detail earlier in the report. The Proposed Scheme will generated vehicle traffic as a result of Birmingham Interchange Station in the adjoining area (CFA24 Birmingham Interchange and Chelmsley Wood). A proportion of these trips will originate from the Balsall Common and Hampton-in-Arden area and further trips will come from beyond the area and travel through to Birmingham Interchange Station.

8.3.90 With the introduction of the Proposed Scheme in 2026, there will be approximately 1,950 rail passengers boarding, alighting and interchanging at Birmingham Interchange station in the AM peak hour (08:00-09:00) and around 2,100 rail passengers boarding, alighting and interchanging at Birmingham Interchange station in the PM peak hour (17:00-18:00).

8.3.91 These passengers are forecast to generate around 20 private vehicle trips in the AM peak hour (08:00-09:00) and 20 private vehicle trips in the PM peak hour (17:00-18:00) through the Hampton-in-Arden area. On the A452 Kenilworth Road through Balsall Common there are forecast to be approximately 150 additional private vehicle trips in the AM peak hour (08:00-09:00) and 120 private vehicle trips in the PM peak hour (17:00-18:00).

8.3.92 These numbers increase to approximately 3,450 passengers using Birmingham Interchange station in the AM peak hour (08:00-09:00) and approximately 3,700 passengers using Birmingham Interchange station in the PM peak hour (17:00-18:00) in 2041 (the Proposed Scheme Phase Two) through increased train frequency and additional national rail destinations.

8.3.93 These passengers are forecast to generate around 30 private vehicle trips in the AM peak hour (08:00-09:00) and 25 private vehicle trips in the PM peak hour (17:00-18:00) through the Hampton-in-Arden area. On the A452 Kenilworth Road through Balsall Common there are forecast to be approximately 250 additional private vehicle trips in the AM peak hour (08:00-09:00) and 200 private vehicle trips in the PM peak hour (17:00-18:00).

8.3.94 Table 8-28 summarises the distribution trip origins for trips travelling through Balsall Common.

Table 8-28: Distribution of trips through Balsall Common

	2026		2041	
	Alighters	**Boarders**	**Alighters**	**Boarders**
Kenilworth	31%	31%	32%	32%
Royal Leamington Spa	43%	43%	42%	42%
Warwick	14%	14%	14%	14%
Balsall Common	1%	1%	1%	1%
Rowington and E of A452	10%	10%	11%	11%
Total	100%	100%	100%	100%

Traffic management road closures and diversions

8.3.95 The Proposed Scheme includes the local realignment and/or reconfiguration of highways at Lavender Hall Lane, Park Lane and the A452 Kenilworth Road and the closure of Diddington Lane which are summarised in Table 8-29.

Table 8-29: Permanent highway diversion

Highway	**Diversion length**	**Reason for diversion/stopping-up**
Lavender Hall Lane (see CT-06-101, Volume 2, Map Book 23)	less than 100m on parallel off-line replacement	Intersects with the Proposed Scheme
Park Lane (see CT-06-102, Volume 2, Map Book 23)	700m	Intersects with the Proposed Scheme
Kenilworth Road (see CT-06-103 and CT-06-104, Volume 2, Map Book 23)	Parallel off-line replacement	Facilitate the Proposed Scheme
Diddington Lane (see CT-06-105a, Volume 2, Map Book 23)	2,850m via Meriden Road and A452 Kenilworth Road	Intersects with the Proposed Scheme

PRoW closures and diversions

8.3.96 The Proposed Scheme also includes the permanent diversion of a number of PRoW which are summarised in Table 8-30.

Table 8-30: Permanent PRoW diversions

PRoW	**Length of diversion**	**Reason for diversion**
Footpath M192 (see CT-06-101, Volume 2, Map Book 23)	210m	Local diversion due to HS2 earthworks
Footpath M196 (see CT-06-101, Volume 2, Map Book 23)	50m	Relocated access due to approach works to new Lavender Hall Lane overbridge
Footpath M214 (Heart of England Way)	20m	HS2 intersects with FP M214 Heart of England

PRoW	Length of diversion	Reason for diversion
(see CT-06-102, Volume 2, Map Book 23)		Way. Footpath will be diverted via the new bridleway overbridge over HS2
Footpath M215 (see CT-06-102, Volume 2, Map Book 23)	50m	HS2 intersects public footpath M215. The footpath will be diverted via a new M215 Overbridge over HS2
Footpath M216 (see CT-06-103, Volume 2, Map Book 23)	1200m	Truncated to allow construction of HS2 and diversion of gas utilities
Footpath M217 (see CT-06-103, Volume 2, Map Book 23)	300m	Relocated to allow construction of HS2 embankment
Footpath M230a (see CT-06-104, Volume 2, Map Book 23)	370m	Permanent diversion along the line of B4102 Meriden Road underbridge. Works to be phased such that bridge is complete prior to permanent diversion

Avoidance and mitigation measures

8.3.97 No further mitigation measures are proposed within the scheme design.

Balsall Common and Hampton-in-Arden (CFA23) assessment of impacts

Key operation transport issues

8.3.98 As part of its design, the Proposed Scheme includes the following measures to reduce the impacts on transport users in the Balsall Common and Hampton-in-Arden area:

- all roads and PRoWs that the Proposed Scheme cross will remain or will be replaced/diverted; and
- a viaduct over Truggist Lane, an overbridge at Lavender Hall Lane, realignment of Lavender Hall Lane, Park Lane and the A452 Kenilworth Road and an overbridge across the A452 Kenilworth Road, to maintain highway connections and accessibility.

8.3.99 In terms of the transport network in the Balsall Common and Hampton-in-Arden area, the Proposed Scheme will also result in:

- an increase in rail capacity on the West Coast Main Line (where Berkswell and Hampton-in-Arden are stations, on the West Coast Main Line, are in the Balsall Common and Hampton-in-Arden area);
- passenger demands accessing the new Birmingham Interchange station (located in the neighbouring Birmingham Interchange and Solihull CFA24), with increases in traffic on the A452 Kenilworth Road;
- a realignment of Lavender Hall Lane;

- a realignment of Park Lane;
- a revised alignment of the A452 Kenilworth Road north of Balsall Common, a new roundabout junction at Park Lane and a reconfigured junction at Bradnock's Marsh Lane;
- the closure of Diddington Lane; and
- diversions of PRoWs.

8.3.100 In addition, occasional traffic may access areas of the Proposed Scheme for maintenance purposes, but such infrequent vehicle movements are anticipated to be very low and, therefore, will have a negligible impact on the strategic and local highway networks.

Strategic road network traffic flows 2026

8.3.101 The Birmingham Interchange station (in the Birmingham Interchange and Chelmsley Wood area, CFA24) will generate traffic on the road network (i.e. traffic originating in or destined for the Balsall Common and Hampton-in-Arden area and traffic passing through the Balsall Common and Hampton-in-Arden area from or to elsewhere).This section summarises the increases in traffic on the A452 Kenilworth Road (as part of the strategic road network) in 2026 as a result of the Proposed Scheme, together with the assessment of the impacts.

8.3.102 Table 8-31 shows a summary of the 2026 future baseline flows for the A452 Kenilworth Road together with the 2026 the Proposed Scheme flows on completion of the Proposed Scheme in the AM peak hour (08:00-09:00).

Table 8-31: Strategic road network AM peak hour (08:00-09:00) traffic flows 2026 future baseline and with the Proposed Scheme traffic (vehicles)

Location	Direction	AM peak (08:00-09:00)							
		2026 baseline (veh)		2026 baseline with the Proposed Scheme traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With the Proposed Scheme
A452 Kenilworth Road (between Wootton Lane and Hallmeadow Road)	NB	1,059	19	1,174	19	10.8%	0.0%	29.4%	32.6%
	SB	846	15	876	15	3.5%	0.0%	47.0%	48.7%
A452 Kenilworth Road (between Windmill Lane and Meer End Road)	NB	895	16	1,009	16	12.7%	0.0%	56.3%	63.5%
	SB	855	15	885	15	3.5%	0.0%	53.8%	55.7%
A452 Kenilworth Road (between Meriden Lane and Marsh Lane)	NB	1,146	20	1,269	20	10.7%	0.0%	31.8%	35.2%
	SB	920	16	958	16	4.1%	0.0%	25.6%	26.6%

Location	Direction	AM peak (08:00-09:00)							
		2026 baseline (veh)		2026 baseline with the Proposed Scheme traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With the Proposed Scheme
A452 Kenilworth Road (between Station Road and Gypsy Lane)	NB	921	16	1,035	16	12.4%	0.0%	59.4%	66.8%
	SB	822	15	852	15	3.6%	0.0%	53.0%	55.0%
A452 Kenilworth Road (south of Stonebridge Roundabout)	NB	1,190	55	1,323	55	11.1%	0.0%	33.1%	36.7%
	SB	1,413	66	1,448	66	2.5%	0.0%	39.2%	40.2%
A452 Kenilworth Road (between Lavender Hall Lane and Station Road)	NB	1,000	18	1,114	18	11.4%	0.0%	64.5%	71.9%
	SB	905	16	935	16	3.3%	0.0%	58.4%	60.3%
A452 Kenilworth Road (between Wootton Green Lane and Lavender Hall Lane)	NB	928	16	1042	16	12.3%	0.0%	59.9%	67.3%
	SB	773	14	803	14	3.9%	0.0%	49.9%	51.8%
A452 Kenilworth Road (between Hallmeadow Road and Wootton Green Lane)	NB	932	17	1,046	17	12.3%	0.0%	60.1%	67.5%
	SB	750	13	780	13	4.0%	0.0%	48.4%	50.3%
A452 Kenilworth Road (between Park Lane and Wootton Lane)	NB	1,015	18	1,129	18	11.3%	0.0%	28.2%	31.4%
	SB	855	15	885	15	3.5%	0.0%	23.8%	24.6%
A452 Kenilworth Road (between Bradnocks Marsh Lane and Park Lane)	NB	1,031	18	1,146	18	11.2%	0.0%	28.6%	31.8%
	SB	878	16	908	16	3.4%	0.0%	24.4%	25.2%
A452 Kenilworth Road (between Bradnocks Marsh Lane and Marsh Lane)	NB	1,137	20	1,266	20	11.3%	0.0%	31.6%	35.2%
	SB	917	16	960	16	4.8%	0.0%	25.5%	26.7%
A452 Kenilworth Road (between Windmill Lane and Kelsey Lane)	NB	734	13	848	13	15.5%	0.0%	46.2%	53.3%
	SB	663	12	693	12	4.5%	0.0%	41.7%	43.6%
A452 Kenilworth Road (between Gypsy Lane and Adler Lane)	NB	686	12	800	12	16.6%	0.0%	43.2%	50.3%
	SB	728	13	757	13	4.1%	0.0%	45.8%	47.6%
A452 Kenilworth	NB	1,114	52	1,372	52	23.1%	0.0%	30.9%	38.1%

Location	Direction	AM peak (08:00-09:00)							
		2026 baseline (veh)		2026 baseline with the Proposed Scheme traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With the Proposed Scheme
Road (between Meriden Road and Diddington Lane)	SB	1,364	63	1,410	63	3.4%	0.0%	37.9%	39.2%
A452 Kenilworth Road (south of Meer End Road)	NB	584	10	698	10	19.5%	0.0%	36.7%	43.9%
	SB	505	9	535	9	5.9%	0.0%	31.8%	33.6%

8.3.103 Table 8-31 clearly shows that traffic will not create any capacity related issues on strategic routes within the area. Where flows are forecast to increase, the roads are all well within capacity (all V/C ratios less than 85%). The most substantial increase is on the A452 Kenilworth Road NB immediately to the south Stonebridge Roundabout where the Proposed Scheme increases demand by around 2 vehicles per minute. This increase is not considered substantial in capacity terms and the impact on Stonebridge Roundabout is considered in the Birmingham Interchange and Chelmsley Wood section of this report.

8.3.104 Table 8-32 shows a summary of the 2026 future baseline flows for the A452 Kenilworth Road together with the 2026 the Proposed Scheme flows on completion of the Proposed Scheme in the PM peak hour (17:00-18:00).

Table 8-32: Strategic road network PM peak hour (17:00-18:00) traffic flows 2026 future baseline and with the Proposed Scheme traffic (vehicles)

Location	Direction	PM peak (17:00-18:00)							
		2026 baseline (veh)		2026 baseline with the Proposed Scheme traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With the Proposed Scheme
A452 Kenilworth Road (between Wootton Lane and Hallmeadow Road)	NB	954	20	965	20	1.2%	0.0%	26.5%	26.8%
	SB	1,175	25	1,283	25	9.3%	0.0%	65.3%	71.3%
A452 Kenilworth Road (between Windmill Lane and Meer End Road)	NB	1,010	22	1,021	22	1.1%	0.0%	63.5%	64.2%
	SB	950	20	1,058	20	11.4%	0.0%	59.8%	66.5%
A452 Kenilworth Road (between Meriden Lane and Marsh Lane)	NB	1,010	22	1,024	22	1.5%	0.0%	28.0%	28.5%
	SB	1,365	29	1,478	29	8.3%	0.0%	37.9%	41.0%

Location	Direction	PM peak (17:00-18:00)							
		2026 baseline (veh)		2026 baseline with the Proposed Scheme traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With the Proposed Scheme
A452 Kenilworth Road (between Station Road and Gypsy Lane)	NB	991	21	1,002	21	1.1%	0.0%	63.9%	64.6%
	SB	869	19	977	19	12.4%	0.0%	56.1%	63.0%
A452 Kenilworth Road (south of Stonebridge Roundabout)	NB	1,369	84	1,381	84	0.9%	0.0%	38.0%	38.3%
	SB	1,633	101	1,759	101	7.7%	0.0%	45.4%	48.9%
A452 Kenilworth Road (between Lavender Hall Lane and Station Road)	NB	912	19	922	19	1.2%	0.0%	58.8%	59.5%
	SB	1,135	24	1,243	24	9.5%	0.0%	73.2%	80.2%
A452 Kenilworth Road (between Wootton Green Lane and Lavender Hall Lane)	NB	830	18	840	18	1.3%	0.0%	53.5%	54.2%
	SB	1,051	22	1,159	22	10.3%	0.0%	67.8%	74.8%
A452 Kenilworth Road (between Hallmeadow Road and Wootton Green Lane)	NB	826	18	837	18	1.3%	0.0%	53.3%	54.0%
	SB	1,051	22	1,159	22	10.3%	0.0%	67.8%	74.8%
A452 Kenilworth Road (between Park Lane and Wootton Lane)	NB	919	20	930	20	1.2%	0.0%	25.5%	25.8%
	SB	1,160	25	1269	25	9.4%	0.0%	32.2%	35.2%
A452 Kenilworth Road (between Bradnocks Marsh Lane and Park Lane)	NB	940	20	951	20	1.2%	0.0%	26.1%	26.4%
	SB	1,152	25	1,261	25	9.5%	0.0%	32.0%	35.0%
A452 Kenilworth Road (between Bradnocks Marsh Lane and Marsh Lane)	NB	1,010	22	1,060	22	5.0%	0.0%	28.0%	29.5%
	SB	1,330	28	1,479	28	11.2%	0.0%	36.9%	41.1%
A452 Kenilworth Road (between Windmill Lane and Kelsey Lane)	NB	867	19	878	19	1.3%	0.0%	54.5%	55.2%
	SB	695	15	803	15	15.5%	0.0%	43.7%	50.5%
A452 Kenilworth Road (between Gypsy Lane and Adler Lane)	NB	763	16	773	16	1.4%	0.0%	48.0%	48.6%
	SB	864	18	972	18	12.5%	0.0%	54.4%	61.1%
A452 Kenilworth Road (between Meriden Road and	NB	1,216	75	1,378	75	13.4%	0.0%	33.8%	38.3%
	SB	1,604	99	1,741	99	8.5%	0.0%	44.6%	48.3%

Location	Direction	PM peak (17:00-18:00)							
		2026 baseline (veh)		2026 baseline with the Proposed Scheme traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With the Proposed Scheme
Diddington Lane)									
A452 Kenilworth Road (south of Meer End Road)	NB	522	11	532	11	2.1%	0.0%	32.8%	33.5%
	SB	621	13	729	13	17.4%	0.0%	39.1%	45.8%

8.3.105 Table 8-32 clearly shows that traffic will not create any capacity related issues on strategic routes within the area. Where flows are forecast to increase, the roads are all well within capacity (all V/C ratios less than 85%). The most substantial increase is on the A452 Kenilworth Road SB immediately to the south Stonebridge Roundabout where the Proposed Scheme increases demand by around 2 vehicles per minute. This increase is not considered substantial and the impact on Stonebridge Roundabout is considered in the Birmingham Interchange and Chelmsley Wood section of this report.

Strategic road network traffic flows 2041 Phase Two

8.3.106 This section summarises the increases in traffic on the A452 Kenilworth Road (as part of the strategic road network) in 2041 as a result of the Proposed Scheme, together with the assessment of the impacts.

8.3.107 Table 8-33 shows a summary of the 2041 future baseline flows for the A452 Kenilworth Road together with the 2041 the Proposed Scheme flows on completion of the Proposed Scheme in the AM peak hour (08:00-09:00).

Table 8-33: Strategic road network AM peak hour (08:00-09:00) traffic flows 2041 future baseline and with the Proposed Scheme traffic (vehicles)

Location	Direction	AM peak (08:00-09:00)							
		2026 baseline (veh)		2026 baseline with the Proposed Scheme traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With the Proposed Scheme
A452 Kenilworth Road (between Wootton Lane and Hallmeadow Road)	NB	1,091	19	1,294	19	18.6%	0.0%	30.3%	36.0%
	SB	871	15	923	15	6.0%	0.0%	48.4%	51.3%
A452 Kenilworth Road (between Windmill Lane and Meer End Road)	NB	922	16	1,124	16	21.9%	0.0%	58.0%	70.7%
	SB	881	16	932	16	5.8%	0.0%	55.4%	58.6%
A452 Kenilworth Road (between	NB	1,180	21	1,392	21	18.0%	0.0%	32.8%	38.7%

Location	Direction	AM peak (08:00-09:00)							
		2026 baseline (veh)		2026 baseline with the Proposed Scheme traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With the Proposed Scheme
Meriden Lane and Marsh Lane)	SB	948	17	1,008	17	6.4%	0.0%	26.3%	28.0%
A452 Kenilworth Road (between Station Road and Gypsy Lane)	NB	949	17	1,151	17	21.3%	0.0%	61.2%	74.2%
	SB	847	15	898	15	6.1%	0.0%	54.6%	57.9%
A452 Kenilworth Road (south of Stonebridge Roundabout)	NB	1,226	57	1,455	57	18.7%	0.0%	34.1%	40.4%
	SB	1,455	68	1,513	68	4.0%	0.0%	40.4%	42.0%
A452 Kenilworth Road (between Lavender Hall Lane and Station Road)	NB	1,030	18	1,233	18	19.7%	0.0%	66.4%	79.5%
	SB	932	17	984	17	5.5%	0.0%	60.2%	63.5%
A452 Kenilworth Road (between Wootton Green Lane and Lavender Hall Lane)	NB	956	17	1,159	17	21.2%	0.0%	61.7%	74.7%
	SB	796	14	848	14	6.5%	0.0%	51.4%	54.7%
A452 Kenilworth Road (between Hallmeadow Road and Wootton Green Lane)	NB	959	17	1,162	17	21.1%	0.0%	61.9%	75.0%
	SB	773	14	824	14	6.7%	0.0%	49.9%	53.2%
A452 Kenilworth Road (between Park Lane and Wootton Lane)	NB	1,045	19	1,248	19	19.5%	0.0%	29.0%	34.7%
	SB	881	16	933	16	5.9%	0.0%	24.5%	25.9%
A452 Kenilworth Road (between Bradnocks Marsh Lane and Park Lane)	NB	1,062	19	1,266	19	19.2%	0.0%	29.5%	35.2%
	SB	904	16	956	16	5.8%	0.0%	25.1%	26.6%
A452 Kenilworth Road (between Bradnocks Marsh Lane and Marsh Lane)	NB	1,171	21	1,389	21	18.6%	0.0%	32.5%	38.6%
	SB	944	17	1,010	17	7.0%	0.0%	26.2%	28.1%
A452 Kenilworth Road (between Windmill Lane and Kelsey Lane)	NB	756	13	958	13	26.7%	0.0%	47.6%	60.3%
	SB	702	12	754	12	7.3%	0.0%	44.2%	47.4%
A452 Kenilworth Road (between	NB	707	13	909	13	28.6%	0.0%	44.5%	57.2%

Location	Direction	AM peak (08:00-09:00)							
		2026 baseline (veh)		2026 baseline with the Proposed Scheme traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With the Proposed Scheme
Gypsy Lane and Adler Lane)	SB	749	13	801	13	6.9%	0.0%	47.1%	50.4%
A452 Kenilworth Road (between Meriden Road and Diddington Lane)	NB	1,147	53	1,506	53	31.2%	0.0%	31.9%	41.8%
	SB	1,405	65	1,474	65	5.0%	0.0%	39.0%	41.0%
A452 Kenilworth Road (south of Meer End Road)	NB	601	11	803	11	33.6%	0.0%	37.8%	50.5%
	SB	520	9	572	9	9.9%	0.0%	32.7%	36.0%

8.3.108 Table 8-33 clearly shows that traffic will not create any capacity related issues on strategic routes within the area. Where flows are forecast to increase, the roads are all well within capacity (all V/C ratios less than 85%). The most substantial increase is on the A452 Kenilworth Road NB immediately to the south Stonebridge Roundabout where the Proposed Scheme increases demand by around 4 vehicles per minute. This increase is not considered substantial and the impact on Stonebridge Roundabout is considered in the Birmingham Interchange and Chelmsley Wood section of this report.

8.3.109 Table 8-34 shows a summary of the 2041 future baseline flows for the A452 Kenilworth Road together with the 2041 the Proposed Scheme flows on completion of the Proposed Scheme in the PM peak hour (17:00-18:00).

Table 8-34: Strategic road network PM peak hour (17:00-18:00) traffic flows 2041 future baseline and with the Proposed Scheme traffic (vehicles)

Location	Direction	PM peak (17:00-18:00)							
		2026 baseline (veh)		2026 baseline with the Proposed Scheme traffic		Percentage impact		V/C ratio	
		Veh	HGV	veh	HGV	veh	HGV	Baseline	With the Proposed Scheme
A452 Kenilworth Road (between Wootton Lane and Hallmeadow Road)	NB	968	21	988	21	2.1%	0.0%	26.9%	27.4%
	SB	1,192	25	1,386	25	16.2%	0.0%	66.2%	77.0%
A452 Kenilworth Road (between Windmill Lane and Meer End Road)	NB	1,025	22	1,044	22	1.9%	0.0%	64.4%	65.7%
	SB	964	21	1,156	21	19.9%	0.0%	60.6%	72.7%

Location	Direction	PM peak (17:00-18:00)							
		2026 baseline (veh)		2026 baseline with the Proposed Scheme traffic		Percentage impact		V/C ratio	
		Veh	HGV	veh	HGV	veh	HGV	Baseline	With the Proposed Scheme
A452 Kenilworth Road (between Meriden Lane and Marsh Lane)	NB	1,025	22	1,048	22	2.3%	0.0%	28.5%	29.1%
	SB	1,385	30	1,583	30	14.3%	0.0%	38.5%	44.0%
A452 Kenilworth Road (between Station Road and Gipsy Lane)	NB	1,006	21	1,025	21	2.0%	0.0%	64.9%	66.2%
	SB	882	19	1,074	19	21.8%	0.0%	56.9%	69.3%
A452 Kenilworth Road (south of Stonebridge Roundabout)	NB	1,389	86	1,410	86	1.5%	0.0%	38.6%	39.2%
	SB	1,657	102	1,874	102	13.1%	0.0%	46.0%	52.1%
A452 Kenilworth Road (between Lavender Hall Lane and Station Road)	NB	925	20	945	20	2.2%	0.0%	59.7%	61.0%
	SB	1,152	25	1,345	25	16.7%	0.0%	74.3%	86.7%
A452 Kenilworth Road (between Wootton Green Lane and Lavender Hall Lane)	NB	842	18	862	18	2.4%	0.0%	54.3%	55.6%
	SB	1,066	23	1,259	23	18.1%	0.0%	68.8%	81.2%
A452 Kenilworth Road (between Hallmeadow Road and Wootton Green Lane)	NB	838	18	858	18	2.4%	0.0%	54.1%	55.3%
	SB	1,066	23	1,259	23	18.1%	0.0%	68.8%	81.2%
A452 Kenilworth Road (between Park Lane and Wootton Lane)	NB	933	20	952	20	2.1%	0.0%	25.9%	26.5%
	SB	1,177	25	1,370	25	16.4%	0.0%	32.7%	38.1%
A452 Kenilworth Road (between Bradnocks Marsh Lane and Park Lane)	NB	954	20	974	20	2.1%	0.0%	26.5%	27.1%
	SB	1,169	25	1,363	25	16.6%	0.0%	32.5%	37.9%
A452 Kenilworth Road (between Bradnocks Marsh Lane and Marsh Lane)	NB	1,025	22	1,085	22	5.9%	0.0%	28.5%	30.1%
	SB	1,350	29	1,584	29	17.4%	0.0%	37.5%	44.0%

Location	Direction	PM peak (17:00-18:00)							
		2026 baseline (veh)		2026 baseline with the Proposed Scheme traffic		Percentage impact		V/C ratio	
		Veh	HGV	veh	HGV	veh	HGV	Baseline	With the Proposed Scheme
A452 Kenilworth Road (between Windmill Lane and Kelsey Lane)	NB	880	19	899	19	2.3%	0.0%	55.3%	56.6%
	SB	791	17	983	17	24.3%	0.0%	49.8%	61.9%
A452 Kenilworth Road (between Gipsy Lane and Adler Lane)	NB	774	17	794	17	2.6%	0.0%	48.7%	49.9%
	SB	877	19	1,069	19	21.9%	0.0%	55.2%	67.2%
A452 Kenilworth Road (between Meriden Road and Diddington Lane)	NB	1,234	76	1,407	76	14.1%	0.0%	34.3%	39.1%
	SB	1,628	101	1,855	101	14.0%	0.0%	45.2%	51.5%
A452 Kenilworth Road (south of Meer End Road)	NB	529	11	549	11	3.7%	0.0%	33.3%	34.5%
	SB	630	13	822	13	30.5%	0.0%	39.6%	51.7%

8.3.110 Table 8-34 clearly shows that traffic will not create any capacity related issues on strategic routes within the area. Where flows are forecast to increase, the roads are all within capacity (all V/C ratios less than 85% with the exception of A452 Kenilworth Road (between Lavender Hall Lane and Station Road which marginally exceeds this value). The most substantial increase is on the A452 Kenilworth Road SB immediately to the south Stonebridge Roundabout where the Proposed Scheme increases demand by around 4 vehicles per minute. This increase is not considered substantial and the impact on Stonebridge Roundabout is considered in the Birmingham Interchange and Chelmsley Wood section of this report.

Local road network traffic flows 2026

8.3.111 This section summarises the increases in traffic on local roads in the area in 2026 as a result of the Proposed Scheme, together with the assessment of the impacts.

8.3.112 Table 8-35 shows a summary of the 2026 future baseline flows for the local roads on which there is an impact forecast together with the 2026 the Proposed Scheme flows on completion of the Proposed Scheme in the AM peak hour (08:00-09:00).

Table 8-35: Local road network AM peak hour (08:00-09:00) traffic flows 2026 future baseline and with the Proposed Scheme traffic (vehicles)

Location	Direction	AM peak (08:00-09:00)							
		2026 baseline (veh)		2026 baseline with the Proposed Scheme traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With the Proposed Scheme
Hallmeadow Road between Lavender Hall Lane and A452 Kenilworth Road	WB	134	0	135	0	0.3%	0.0%	11.8%	11.8%
Park Lane	WB	2	0	3	0	17.8%	0.0%	0.3%	0.3%
Meriden Road between A452 Kenilworth Road and Diddington Lane	EB	501	3	710	3	41.7%	0.0%	45.1%	63.9%
	WB	537	3	560	3	4.2%	0.0%	48.4%	50.4%
Meriden Road west of Diddington Lane	EB	712	4	729	4	2.4%	0.0%	64.1%	65.7%
	WB	546	3	551	3	0.9%	0.0%	49.2%	49.6%
Diddington Lane at Meriden Road	NB	220	1	28	1	-87.3%	0.0%	29.3%	3.7%
	SB	17	0	0	0	-100.0%	0.0%	2.3%	0.0%
Diddington Lane at A452 Kenilworth Road	EB	192	1	0	1	-100.0%	0.0%	25.6%	0.0%
	WB	40	0	23	0	-43.5%	0.0%	5.4%	3.0%

8.3.113 Table 8-35 clearly shows that traffic will not create any capacity related issues on local routes within the area. The most substantial increase is on Meriden Road EB between A452 Kenilworth Road and Diddington Lane which sees a 42% increase in traffic. This increase is largely related to the closure of Diddington Lane. The increase is not expected to result in any substantial capacity issues (V/C ratios less than 85%).

8.3.114 Table 8-36 shows a summary of the 2026 future baseline flows for the local roads on which there is an impact forecast together with the 2026 the Proposed Scheme flows on completion of the Proposed Scheme in the PM peak hour (17:00-18:00).

Table 8-36:- Local road network PM peak hour (17:00-18:00) traffic flows 2026 future baseline and with the Proposed Scheme traffic (vehicles)

Location	Direction	PM peak (17:00-18:00)							
		2026 baseline (veh)		2026 baseline with the Proposed Scheme traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With the Proposed Scheme
Meriden Road between A452 Kenilworth Road and Diddington Lane	EB	447	3	599	3	34.2%	0.0%	40.2%	54.0%
	WB	420	3	447	3	6.4%	0.0%	37.9%	40.3%
Meriden Road west of Diddington Lane	EB	559	4	560	4	0.2%	0.0%	50.4%	50.5%
	WB	454	3	471	3	3.7%	0.0%	40.9%	42.4%
Diddington Lane at Meriden Road	NB	152	1	0	1	-100.0%	0.0%	20.2%	0.0%
	SB	29	0	19	0	-34.8%	0.0%	3.8%	2.5%
Diddington Lane at A452 Kenilworth Road	EB	171	1	19	1	-89.0%	0.0%	22.7%	2.5%
	WB	10	0	0	0	-100.0%	0.0%	1.3%	0.0%

8.3.115 Table 8-36 clearly shows that traffic will not create any capacity related issues on local routes within the area. As with the AM peak hour (08:00-09:00), the most substantial increase is on Meriden Road EB between A452 Kenilworth Road and Diddington Lane which sees a 34% increase in traffic. This increase is largely related to the closure of Diddington Lane and will not result in any substantial capacity issues.

Local road network traffic flows 2041 Phase Two

8.3.116 This section summarises the increases in traffic on local roads in the area in 2041 as a result of the Proposed Scheme, together with the assessment of the impacts.

8.3.117 Table 8-37 shows a summary of the 2041 future baseline flows for the local roads on which there is an impact forecast together with the 2041 the Proposed Scheme flows on completion of the Proposed Scheme in the AM peak hour (08:00-09:00).

Table 8-37: Local road network AM peak hour (08:00-09:00) traffic flows 2041 future baseline and with the Proposed Scheme traffic (vehicles)

Location	Direction	AM peak (08:00-09:00)							
		2041 baseline (veh)		2041 baseline with the Proposed Scheme traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With the Proposed Scheme
Hallmeadow Road between Lavender Hall Lane and A452 Kenilworth Road	EB	110	0	111	0	0.2%	0.0%	9.7%	9.7%
	WB	147	1	148	1	0.5%	0.0%	12.9%	12.9%
Park Lane	WB	2	0	3	0	28.5%	0.0%	0.3%	0.4%
Meriden Road between A452 Kenilworth Road and Diddington Lane	EB	511	3	732	3	43.2%	0.0%	46.1%	66.0%
	WB	549	3	572	3	4.3%	0.0%	49.4%	51.6%
Meriden Road west of Diddington Lane	EB	727	4	752	4	3.4%	0.0%	65.5%	67.7%
	WB	558	3	564	3	1.1%	0.0%	50.2%	50.8%
Diddington Lane at Meriden Road	NB	224	1	28	1	-87.3%	0.0%	29.9%	3.8%
	SB	18	0	0	0	-100.0%	0.0%	2.4%	0.0%
Diddington Lane at A452 Kenilworth Road	EB	196	1	0	1	-100.0%	0.0%	26.1%	0.0%
	WB	41	0	23	0	-43.5%	0.0%	5.5%	3.1%

8.3.118 As in 2026, Table 8-37 clearly shows that traffic will not create any capacity related issues on local routes within the area. The most substantial increase is on Meriden Road EB between A452 Kenilworth Road and Diddington Lane which sees a 43% increase in traffic and is largely related to the closure of Diddington Lane.

8.3.119 Table 8-38 shows a summary of the 2041 future baseline flows for the local roads on which there is an impact forecast together with the 2041 the Proposed Scheme flows on completion of the Proposed Scheme in the PM peak hour (17:00-18:00).

Table 8-38: Local road network PM peak hour (17:00-18:00) traffic Flows 2041 future baseline and with the Proposed Scheme traffic (vehicles)

		PM peak (17:00-18:00)							
		2041 baseline (veh)		2041 baseline with the Proposed Scheme traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With the Proposed Scheme
Park Lane	EB	40	0	41	0	1.6%	0.0%	5.3%	5.4%
Meriden Road between A452 Kenilworth Road and Diddington Lane	EB	619	4	830	4	34.2%	0.0%	55.7%	74.8%
	WB	582	4	619	4	6.3%	0.0%	52.5%	55.8%
Meriden Road west of Diddington Lane	EB	775	5	776	5	0.1%	0.0%	69.8%	69.9%
	WB	629	4	652	4	3.7%	0.0%	56.7%	58.8%
Diddington Lane at Meriden Road	NB	210	1	0	1	-100.0%	0.0%	28.0%	0.0%
	SB	40	0	26	0	-34.8%	0.0%	5.3%	3.5%
Diddington Lane at A452 Kenilworth Road	EB	236	2	26	2	-89.0%	0.0%	31.5%	3.5%
	WB	14	0	0	0	-100.0%	0.0%	1.9%	0.0%

8.3.120 Table 8-38 clearly shows that traffic will not create any capacity related issues on local routes within the area. As with the AM (08:00-09:00) peak, the most substantial increase is on Meriden Road EB between A452 Kenilworth Road and Diddington Lane which sees a 34% increase in traffic. This increase is largely related to the closure of Diddington Lane and will not result in any substantial capacity issues.

Accidents and safety

8.3.121 The baseline safety assessment identified no locations at which there have been nine or more accidents over the last three year period and there are no safety analyses and reports for the future baseline assessment.

8.3.122 Increases in traffic have the potential to result in an increase in accidents however, it is not expected that the Proposed Scheme will have any substantial impacts in the Balsall Common and Hampton-in-Arden area (in terms of either the 2026 or 2041 operation assessments), as there are no locations where there are existing highway safety issues or substantial increases in traffic due to the Proposed Scheme.

Parking

8.3.123 There are no committed changes in the car parks or parking restrictions in the Balsall Common and Hampton-in-Arden area. It is not expected that the Proposed Scheme will have any substantial impacts on car parking or parking restrictions in the Balsall Common and Hampton-in-Arden area, in terms of either the 2026 or 2041 operation assessments, with 'fly' car parking for the Birmingham Interchange not anticipated to be a problem as over 6,000 dedicated car parking spaces will be provided, on site, at the Birmingham Interchange station

Rail

8.3.124 The key station in the area, in terms of the strategic rail network, is Birmingham International Station, but it is located to the north of the Balsall Common and Hampton-in-Arden area and is included in the Birmingham Interchange and Solihull area section within this report.

8.3.125 As a result of the Proposed Scheme, rail passengers in the Balsall Common and Hampton-in-Arden area will potentially benefit from the rail capacity released on the West Coast Main Line, with substantially improved journey times to London, and other rail stations, and the potential for additional rail destinations, via Birmingham International Station. However, these benefits have not been quantified in terms of either the 2026 or 2041 operation assessments.

8.3.126 The local rail network will provide a means of access to the Proposed Scheme, although it is considered unlikely that potential users of the Proposed Scheme in the Balsall Common and Hampton-in-Arden area would use the local rail network to access the Birmingham Interchange station (via Berkswell Station/Hampton-in-Arden Station, Birmingham International Station and the automated people mover link to the Birmingham Interchange station).

8.3.127 The Proposed Scheme will also release capacity on the West Coast Main Line in terms of the local rail network, providing the potential for an increase in local service provision. Berkswell and Hampton-in-Arden stations are located in the Balsall Common and Hampton-in-Arden area, providing local train services to Birmingham International Station and Birmingham New Street Station and intermediary stations and to Coventry Station and intermediary local stations respectively. Therefore, there will be potential benefits to commuters and rail users in the Balsall Common and Hampton-in-Arden area of the released capacity on the West Coast Main Line, although the extent of these benefits has not been quantified in terms of either the 2026 or 2041 operation assessments.

Local bus and coach services

8.3.128 There are no committed changes in bus services in the Balsall Common and Hampton-in-Arden area. However, the Proposed Scheme will require relatively minor route changes for services that use Park Lane and Lavender Hall Lane. These changes will require route changes of less than a minute and less than 0.2 kilometres and will not have any substantial impact on bus operations.

8.3.129 There are no long distance coach services in the Balsall Common and Hampton-in-Arden area, and no committed proposals for long distance coach services in the Balsall Common and Hampton-in-Arden area in terms of either the 2026 or 2041 operation assessments.

Public transport interchanges

8.3.130 There are no substantial public transport interchange facilities in the Balsall Common and Hampton-in-Arden area, and no committed proposals for public transport interchange facilities in the Balsall Common and Hampton-in-Arden area in terms of either the 2026 or 2041 operation assessments.

Taxis

8.3.131 There are no committed changes in the arrangements or facilities for taxis in the Balsall Common and Hampton-in-Arden area. It is not expected that the Proposed Scheme will have any substantial impacts on the arrangements or facilities for taxis in the Balsall Common and Hampton-in-Arden area, in terms of either the 2026 or 2041 operation assessments.

Pedestrian, cyclists and equestrians

8.3.132 There are no committed changes in the facilities for pedestrians and cyclists in the Balsall Common and Hampton-in-Arden area other than those required to facilitate the Proposed Scheme.

8.3.133 Relative to construction of the proposed the Proposed Scheme, the impacts on PRoWs resulting from the operation of the Proposed Scheme will be lower as PRoWs will be re-instated or diverted.

8.3.134 Table 8-39 summarises the expected impacts to the PROWs and roadside footways in the Balsall Common and Hampton-in-Arden area.

Table 8-39: Summary of PROW impacts (operation)

Location	Distance change (m)	Journey time change (min)	Number affected (per day)
M191 off Truggist Lane, near Truggist Hill Farm where crosses dismantled Railway	10	0.1	8
M192 off Truggist Lane, where crosses dismantled Railway near existing railway line	-80	-1.0	9
M196/M197 off Truggist Lane, where right of way meets the rights of way from Lavender Hall Farm and Baulk Lane	0	0	5
M196/M191 off Baulk Lane, where right of way meets the right of way from Lavender Hall Farm	80	1.0	2
M196 off Lavender Hall Lane, to the east of Lavender Hall Farm	-5	-0.1	2
M196 off Lavender Hall Lane, to the north of Lavender Hall Farm	-5	-0.1	2
Lavender Hall Lane	20	0.2	3
Park Lane	200	2.4	23
M214 off Park Lane	0	0.0	6
M215 off the A452, east of Holly Acre Lodge	10	0.1	4
M216 off the A452 near Sixteen Acre Wood	110	1.3	32
M217 off the A452 near Marsh Farm	250	3.0	36
M216 near Marsh Farm	0	0	10
M218 Private Road/ Bridleway off A452 opposite Marsh Lane	160	1.9	12
A452 (Kenilworth Road)	0	0.0	3
Footpath off A452 (Kenilworth Road)	0	0	19
M230A off Meriden Road, south of Patrick Farm	130	1.5	18
Meriden Road	0	0.0	110
M118 off Meriden Road	0	0	2
M115 off Diddington Lane	110	1.3	1
Diddington Lane	110	1.3	2
Kenilworth Greenway	0	0.0	192
Kenilworth Greenway (west of Beechwood Farm)	0	0.0	130

8.3.135 Table 8-39 shows that there will be no substantial changes to the pedestrian routes around the area as a result of the Proposed Scheme. In some instances, existing walk routes will be shortened.

8.3.136 The Proposed Scheme is not expected to result in any substantial impact on pedestrians and all connections will be maintained. In some instances additional footbridges will be provided and this will result in hindrances but the impact of these is minimal.

8.3.137 There are no specific impacts on cycling in the Balsall Common and Hampton-in-Arden area other than where they affect PRoWs, which are identified above.

8.3.138 It is not expected that the Proposed Scheme will have any substantial impacts on equestrian facilities in the Balsall Common and Hampton-in-Arden area, in terms of either the 2026 or 2041 operation assessments, other than where they affect PRoWs, which are identified above.

Waterways and canals

8.3.139 There are no navigable waterways or canals in the Balsall Common and Hampton-in-Arden area.

Air transport

8.3.140 Birmingham Airport is located to the north of the Balsall Common and Hampton-in-Arden area and is included in the Birmingham Interchange and Solihull area section within this report.

8.4 Birmingham Interchange and Chelmsley Wood (CFA24)

Birmingham and Chelmsley Wood (CFA24) Proposed Scheme description

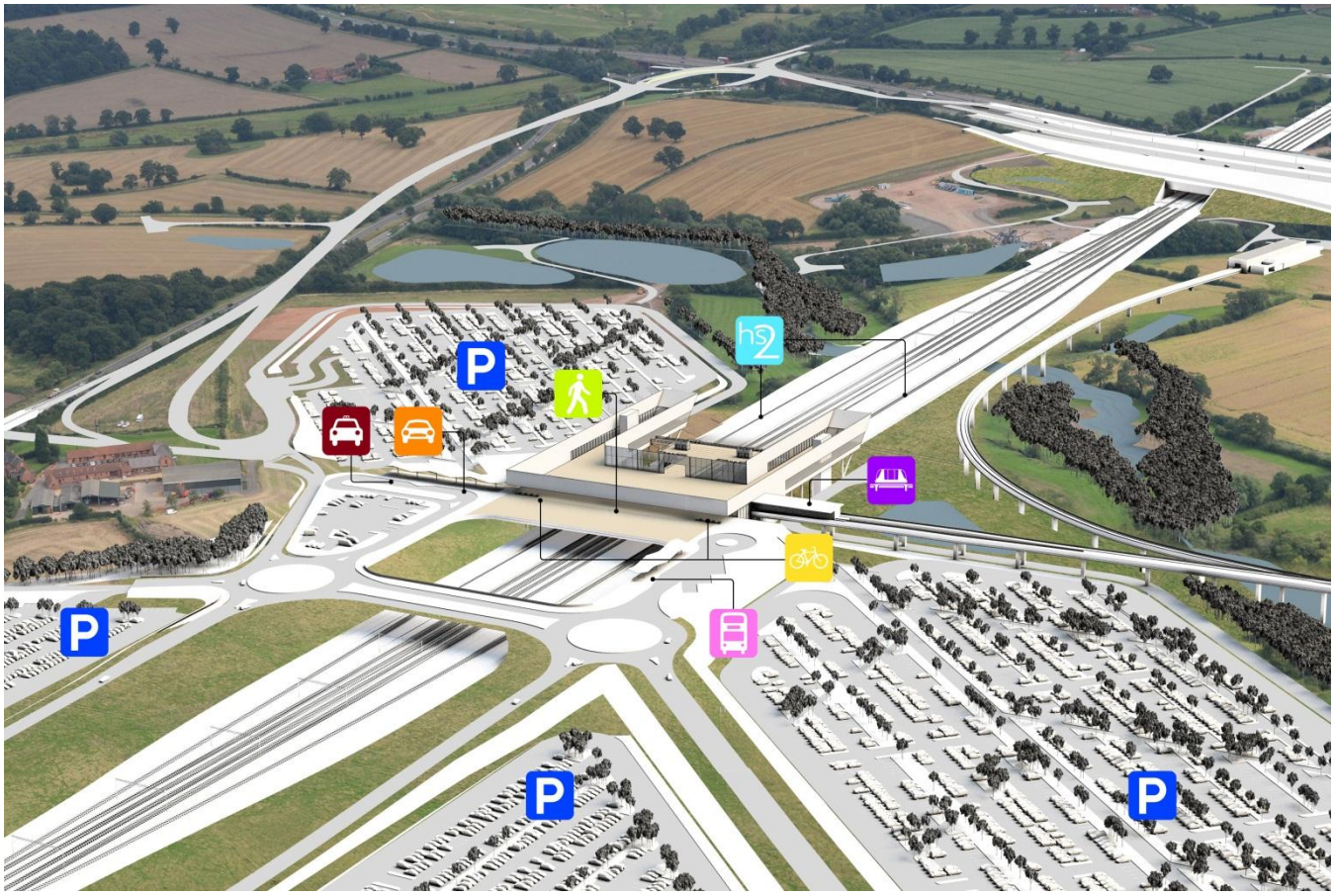
8.4.1 Figure 2, Volume 2 (CFA24) details the location of the CFA. Balsall Common & Hampton-in-Arden (CFA23) lies to the south and Coleshill Junction (CFA19) lies to the north.

8.4.2 The Proposed Scheme through this area will include a brand new rail station referred to as Birmingham Interchange, the location of which is shown in Figure 8-4.

Figure 8-4: Location of proposed Birmingham Interchange station

8.4.3 The station will provide opportunities for multi-modal interchange with bus facilities, connections to rail services at Birmingham International station, taxi, kiss and ride as well as car parking all included (see Figure 8-5).

Figure 8-5: Proposed Birmingham Interchange station intermodal layout



8.4.4 Birmingham Interchange will widen opportunities for millions of people by improving connections between the west Midlands and Britain's other major cities including London, Manchester, Sheffield and Leeds. Birmingham Interchange station plays a key role as a hub in the Hs2 network. The improved connectivity provided by the Proposed Scheme will unlock the potential in the region bringing opportunities to Birmingham making it a more attractive place to locate.

8.4.5 Birmingham Interchange station will be located at the centre of the west Midlands transport network, being directly connected to Birmingham International train station and Birmingham Airport by a dedicated people mover as well as to the wider region via the highway network including the M42 and M6 motorways. With the inclusion of the people mover as a central part of the Proposed Scheme, there will be a direct, fast and efficient link between Birmingham Interchange station and west Coast Main Line rail services and international air services operating from Birmingham Airport. The station will also be directly connected to the local bus network, offering local connections to Solihull, Coventry and the east side of Birmingham.

8.4.6 Through its direct access to the motorway network (M42 and M6) Birmingham Interchange station will provide access to the high speed rail network with its reduced journey times for a substantial part of the travelling public in the west Midlands region.

8.4.7 The projected high speed services from Birmingham Interchange station once Phase Two of the Proposed Scheme is open will be:

- 36 minutes to London, compared with 1hr 10 minutes today -three trains per hour.
- 47 minutes to Leeds, compared with 2hr 30 minutes today - two trains per hour.
- 36 minutes to Manchester compared with 1hr 55 minutes today - two trains per hour.

8.4.8 The Proposed Scheme will also free up space for commuter, regional and freight services on the main north-south lines including the west Coast Mainline, benefiting passengers and business both on and off the new high speed network. This will provide additional capacity along the west Coast Mainline, providing improvement to the current service.

8.4.9 The Proposed Scheme will support regional growth by delivering growth, with the provision of 3,800 jobs in the immediate Birmingham Interchange station area.

8.4.10 The Proposed Scheme through this area (see Map CT-06-105b to Map CT-06-107-R1, Volume 2, Map Book 24) is approximately 4.35 km in length, commencing south-east of the A45 Coventry Road in Hampton-in-Arden, the route will then proceed north-west into a triangular site with the A452 Chester Road to the east, the M42, Birmingham Airport and NEC to the west and the A45 Coventry Road to the south.

8.4.11 Within the triangular site a new Proposed Scheme station and associated infrastructure, known as Birmingham Interchange station, will be constructed together with a people mover and people mover depot. The people mover will provide connectivity between this new station, the NEC, Birmingham International rail station and Birmingham Airport.

8.4.12 Leaving the triangular site, the route will continue north-west, crossing over the M42 on viaduct, the route will then continue over the M6 on viaduct with Chelmsley Wood residential estate located to the south-west. The route will leave this area at the administrative boundary between SMBC and NWBC, in close proximity to where the M42 intersects with the M6.

M42 junction 6, A45 Coventry Road, A452 Chester Road/A45 Coventry Road Roundabout (Stonebridge Island) and A452 Chester Road

8.4.13 The Proposed Scheme through this section is shown on Map CT-06-105b and Map CT-06-106-L1, Volume 2, Map Book 24.

8.4.14 The Proposed Scheme will intersect the A45 Coventry Road north-west of Bickenhill Waste Recycling Centre. The route will still be in cutting, but will gradually rise to ground level just past the A45 Coventry Road before entering into the area of the Birmingham Interchange station (see section Birmingham Interchange station and surrounding area).

8.4.15 In this area there will be highway works to the M42 junction 6 and Stonebridge Island, to provide greater capacity to the existing highway network to facilitate travel to/from Birmingham Interchange station. Details of these improvements are discussed later in this section as part of the highway mitigation proposals.

8.4.16 In addition, the following works are proposed in this area:

- A45 Coventry Road, A45 Service Road, A452 Chester Road and Eastway realignment to facilitate the Proposed Scheme. The vertical alignment of the A45 Coventry Road will be raised by more than 3m on an elevated bridge structure to cross over the route. The A45 Service Road and east Way adjacent to the A45 Coventry Road will be realigned and raised by more than 3m.
- Diversion of Footpath M107 which will be permanently diverted parallel to the replacement access for the National Motorcycle Museum.
- Diversion of Footpath M96 adjacent to the realigned A452 Chester Road.

Birmingham Interchange station and surrounding area

8.4.17 The approximate length of this section is 1km. From Hollywell Brook underbridge, the route will pass through the proposed Birmingham Interchange station. Figure 8-6 is a visualisation of the design of the proposed Birmingham Interchange station, people mover, surrounding public realm, road infrastructure and car parking.

Figure 8-6: Birmingham Interchange station visualisation

8.4.18 Details of the Proposed Scheme through this section are shown on Map CT-06-106, Volume 2, Map Book 24.

8.4.19 Key transport features of Birmingham Interchange station will include:

- a platform for the people mover located to the north-west corner of the station.
- two surface level terraced car parks to the east and west of the station and a long stay car park to the north-east of the station. The car parks will provide 6,400 parking spaces.
- the station will have a short stay car pick up and drop off area, bus pick up and drop off area, taxi rank and coach parking at the front of the station.
- a network of internal roads to provide access to the station and car parks. These internal roads will connect to the A452 Chester Road/A446 Stonebridge Road roundabout and a station entry link road will be provided off the realigned dual three lanes A452 Chester Road to a new roundabout located east of the station. The roundabout will provide access to the Birmingham Interchange station east car park. The exit road onto the A452 Chester Road will cross under the existing carriageway and merge onto the southbound A452 Chester Road.

8.4.20 Middle Bickenhill Lane will remain open from east Way to the intersection with the proposed people mover, the remaining section from this point to the A452 Chester Road will be permanently closed.

8.4.21 Exiting Birmingham Interchange station, the route of the Proposed Scheme will continue north-west to the A452 Chester Road/A446 Stonebridge Road roundabout.

People mover and people mover depot

8.4.22 A people mover of up to 17m in height and 2.3km in length will operate from the Birmingham Interchange station, moving south-west crossing over the M42, east Way, Pendigo Lake and the Rugby to Birmingham Rail Line before continuing onto Birmingham Airport (see Maps CT-06-106, CT-06-106-L1 and CT-06-106-L2 Volume 2, Map Book 24).

8.4.23 There will be four stops along the route of the people mover:

- Birmingham Interchange station (see Volume 2: Map CT-06-106 -G7)
- the NEC (see Volume 2: Map CT-06-106-L1-E9)
- Birmingham International rail station (see Volume 2: Map CT-06-106-L2-E3) and
- Birmingham Airport (see Volume 2: Map CT-06-106-L2-C6).

8.4.24 The people mover will operate seven days a week, with the first service operating approximately 30 minutes before the departure of the first Proposed Scheme train to 15 minutes after the arrival of the last Proposed Scheme train.

8.4.25 The route and structural proposals have been designed to allow a system that will provide for movement of at least 2100 passengers per direction per hour at peak times, running at 3 minute intervals and speeds of up to 90km per hour. Waiting times will normally not exceed 4 minutes, but will be up to a maximum of 15 minutes during major NEC events. The journey time from Birmingham Interchange station to Birmingham Airport will be approximately six minutes.

8.4.26 A single storey depot for the people mover will be provided with the depot accessed via an access road off the east Way. Parking will be provided for maintenance staff.

A452 Chester Road/A446 Stonebridge Road roundabout and associated highway works

8.4.27 The Proposed Scheme through this section is shown on Map CT-06-106 which is provided on the figures above.

8.4.28 A new junction is proposed to replace the existing A452 Chester Road/B4438 Bickenhill Parkway roundabout which is removed to accommodate the Proposed Scheme alignment.

8.4.29 The new A452 Chester Road/A446 Stonebridge Road roundabout will reconnect the existing road network severed by the route and will provide access north-west to Birmingham Interchange station. The new roundabout will be located south-east of the existing junction and will be located over the route. Highway works associated with the new A452 Chester Road/A446 Stonebridge Road roundabout (see Volume 2: Map CT-06-106-C6) and connecting roads will include:

- a new A452 Chester Road/A446 Stonebridge Road roundabout to replace the existing roundabout over the M42 due to the route passing over the M42 on viaduct.
- diversion of the A452 northbound carriageway just north of where it diverges from the northbound A446 Stonebridge Road and provision of a new A452 northbound link road to the south-east corner of the A452 Chester Road/A446 Stonebridge Road roundabout. The existing carriageway will be removed up to Common Farm (see Volume 2: Map CT-06-106-D5);
- the closure of the existing A452 Chester Road southbound carriageway. The carriageway will be removed just south of Melbicks Garden and Leisure Centre. The existing structure over the A446 Stonebridge Road will be additionally removed and a new A452 Chester Road southbound link road will be constructed between the south-east corner of the A452 Chester Road/A446 Stonebridge Road roundabout and the existing A452 Chester southbound carriageway, approximately 200m north of Packington Lane.
- new access and egress road will be provided for Melbicks Garden and Leisure Centre off the A452 Chester Road/A446 Stonebridge Road roundabout, this access road will also provide an entry to Quartz Point Business Park (see Volume 2: Map CT-06-107-I5);
- a new A446 southbound off link to the west of Melbicks Garden and Leisure Centre off the existing A452 Chester Road and connecting into the north-eastern corner of the A452 Chester Road/A446 Stonebridge Road roundabout (see Volume 2: Maps CT-06-106 and CT-06-107);
- northbound traffic heading to M6 junction 4 and Coleshill from the Birmingham Interchange station will use the realigned A446 Stonebridge Road northbound on link which will run parallel to the A446 Stonebridge Road southbound off link before connecting back into the existing merge lane parallel to the A446 Stonebridge Road (see Volume 2: Maps CT-06-106 and CT-06-107);
- a new A452 Chester Road dual carriageway link road, from the north-west corner of the A452 Chester Road/A446 Stonebridge Road roundabout, which will cross the M42 before connecting with a new roundabout located off the B4438 Bickenhill Parkway, north Way and B4438 link road. The new

roundabout will replace an existing roundabout (see Volume 2: Map CT-06-107-H8); and

- realignment of the existing B4438 Bickenhill Parkway dual carriageway link and provision of a new roundabout on the west side of the existing A452 Chester Road/A446 Stonebridge Road roundabout. This roundabout will serve Birmingham Business Park and provide connections to the A452 Chester Road (see Volume 2: Map CT-06-107-F7).

A452 Chester Road/A446 Stonebridge Road roundabout to the end of Birmingham Interchange and Chelmsley Wood CFA

8.4.30 The Proposed Scheme through this section is shown on Map CT-06-107 and Map CT-06-107-R1, Volume 2, Map Book 24.

8.4.31 The approximate length of this section will be 2.4km. From the A452 Chester Road/A446 Stonebridge Road roundabout the route will continue north-west on embankment (known as Packington embankment), up to 6m in height, to the M42 viaduct. The viaduct as it crosses the M42 at an angle will be approximately 215m in length and up to 8m in height from existing ground level to the west of the M42 cutting. The length of the viaduct crossed by the Proposed Scheme is approximately 47m. On leaving the viaduct the route will continue on embankment (known as Pool Wood embankment) up to 11m in height before entering Coleshill junction area (CFA19).

8.4.32 In this area there will be highway works to the M6 junction 4 to provide greater capacity to the existing highway network to facilitate travel to/from Birmingham Interchange station. Details of these improvements are discussed later in this section as part of the highway mitigation proposals.

8.4.33 Other highway improvement works associated with this section will include:

- widening of the northbound carriageway of A446 Stonebridge Road from two to three lanes (see Volume 2: Map CT-06-106-B5). The widening will take place in the existing central reserve; and
- Coleshill Heath Road will be lowered locally by approximately 0.5m to enable the route to cross over the Coleshill Heath underbridge, which will be a single span bridge and approximately 7m high (see Volume 2: Map CT-06-107-R1-E9).

Assessment methodology

8.4.34 The assessment methodology is consistent with that outlined in the regional methodology section of the report for the west Midlands with the exceptions outlined in the following sections.

Birmingham Interchange and Chemlsley Wood (CFA24) Proposed Scheme future baseline

Key future baseline issues

8.4.35 For the Birmingham Interchange and Chelmsley Wood area (CFA24) the key issues for the future baseline arise from the continued growth in traffic and the impact that this has on traffic flows and the operation of the network particularly around M42 junction 6.

Land use assumptions

8.4.36 Future baseline transport conditions have been informed principally by the west Midlands Regional PRISM model as discussed earlier in the report. The PRISM model uses land use planning assumptions provided by local authorities in the region to derive patterns of movement around the network. This provides localised growth rates which have been adopted for assessment purposes in the area to consider future baseline conditions. In addition to the growth provided by PRISM, consideration has been given to major committed within the area which may influence traffic patterns at a local level.

8.4.37 For the Birmingham Interchange and Chelmsley Wood CFA (CFA24), the following committed developments have been included:

- Birmingham Airport Runway Extension (including the realignment of the A45),
- AEC development at Birmingham Business Park, and
- Resortsworld Birmingham leisure complex at the NEC.

8.4.38 The forecast traffic associated with each of the development proposals have been sourced from relevant supporting information submitted with the respective planning applications.

8.4.39 The resulting growth between 2012 and 2021, 2026 and 2041 has been applied to the 2012 baseline flows to inform future baseline conditions. Growth has been applied based on origins and destinations and also on a road by road basis recognising that the growth in demand on different road types may be variable. Table 8-40 provides a summary of the overall growth that has been adopted for the area between 2012 and 2021, 2026 and 2041.

Table 8-40: Summary of growth applied to CFA24

	AM peak hour (08:00-09:00)	**PM peak hour (17:00-18:00)**
2012 - 2021	16%	16%
2012 - 2026	22%	24%
2012 - 2041	42%	44%

8.4.40 The above growth forecasts have been used to inform the future baseline conditions discussed below.

Transport supply assumptions

8.4.41 As part of the Birmingham Airport Runway Extension, transport mitigation works are proposed to the highway network in the area including the realignment of A45 Coventry Road and capacity improvements to M42 junction 6. The works have been included in the 2021, 2026 and 2041 future baseline models.

8.4.42 The Highways Agency has secured funding to provide capacity improvements to M42 junction 6. The works have been included in the 2021, 2026 and 2041 future baseline models.

8.4.43 The west Midlands Local Transport Plan (west Midlands LTP3, with a plan period of 2011 - 2026) includes the Birmingham Interchange and Chelmsley Wood area within a sub-region it defines as "Birmingham and Urban Solihull". The Birmingham and Urban Solihull sub-region covers a substantial part of the west Midlands conurbation, including Birmingham, Solihull, Birmingham Airport, the NEC and key parts of the Birmingham Motorway Box and the west Midlands bus, coach and rail networks, with a wide range of aspirations, policies, programmes and schemes designed to reduce congestion and improve accessibility and connectivity by public transport. Although Centro is bidding for funding around such aspirations, policies, programmes and schemes, they are not commitments and, consequently, in the context of the Birmingham Interchange and Chelmsley Wood area, they have not been allowed for in the future baseline assessment.

Strategic and local road network traffic flows

8.4.44 This section outlines traffic flows on the highway network in the Birmingham Interchange and Chelmsley Wood area to enable consideration of the impact of the Proposed Scheme on the future baseline conditions in the area.

8.4.45 The network in the area includes a number of strategic links including M42, M6, A45, A452 and the A446. Table 8-41 summarises the 2021, 2026 and 2041 AM peak hour forecast traffic flows for these routes compared to 2012 and provides a summary of the V/C ratios for each location.

8.4.46 Table 8-42 summarises the 2021, 2026 and 2041 PM peak hour forecast traffic flows for these routes compared to 2012 and provide a summary of the v/c ratios for each location.

8.4.47 Table 8-41 and Table 8-42 show that traffic levels on strategic routes are expected to increase and that in a number of locations, the network is likely to be approaching its capacity.

8.4.48 The impact of this change in 2026 and 2041 has been assessed in the Birmingham Interchange VISSIM model and the results are reported later in this section. The impact of the change in 2021 has not been assessed as construction related movements are expected to occur outside of the peak hours and there are no long term closures proposed as a result of construction. Consequently the construction of the Proposed Scheme is not expected to have a significant impact on the road network operation during the highway peak hours.

8.4.49 There are a number of local roads in the area most of which will be unaffected by the Proposed Scheme. Table 8-43 summarises 2021, 2026 and 2041 AM peak hour forecast traffic flows for the main local roads within the area.

8.4.50 Table 8-44 summarises 2021, 2026 and 2041 PM peak hour forecast traffic flows for the main local roads within the area.

Table 8-41: Strategic road network AM peak hour traffic flows 2021, 2026 and 2041 (vehicles)

Location	Dir	AM peak (08:00-09:00)											
		2012			2021			2026			2041		
		veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C
A446 (Stonebridge Road) between M6 junction 4 and slips to A452	NB	1040	64	28.9%	1160	72	32.2%	1186	73	32.9%	1221	75	33.9%
	SB	1837	113	51.0%	2049	127	56.9%	2095	129	58.2%	2157	133	59.9%
A452 (Chester Road) between Birmingham Business Park Roundabout and Melbicks	SB	713	44	19.8%	795	49	22.1%	813	50	22.6%	837	52	23.3%
	NB	785	48	21.8%	876	54	24.3%	895	55	24.9%	922	57	25.6%
A446 north of A452 slips	NB	1043	64	29.0%	1164	72	32.3%	1189	73	33.0%	1225	76	34.0%
	SB	1169	72	32.5%	1304	81	36.2%	1333	82	37.0%	1373	85	38.1%
A452 Between Packington Lane and Stonebridge Island	NB	1809	112	50.2%	2018	125	56.1%	2063	127	57.3%	2124	131	59.0%
	SB	1944	120	54.0%	2169	134	60.2%	2217	137	61.6%	2283	141	63.4%
A45 east of Stonebridge Island	EB	1598	99	44.4%	1783	110	49.5%	1822	113	50.6%	1877	116	52.1%
	WB	2326	144	64.6%	2595	160	72.1%	2652	164	73.7%	2731	169	75.9%
A45 between M42 junction 6 and Stonebridge Island	EB	2169	134	38.7%	2420	149	43.2%	2474	153	44.2%	2548	157	45.5%
	WB	2711	167	48.4%	3024	187	54.0%	3091	191	55.2%	3184	197	56.8%
M42 south of junction 6	NB	5026	292	69.8%	5220	303	72.5%	5247	305	72.9%	5604	326	77.8%
	SB	5304	308	73.7%	5509	320	76.5%	5538	322	76.9%	5914	344	82.1%
M42 north of junction 6	NB	4026	234	55.9%	4182	243	58.1%	4203	244	58.4%	4489	261	62.3%
	SB	5668	329	78.7%	5887	342	81.8%	5918	344	82.2%	6320	367	87.8%

Location	Dir	AM peak (08:00-09:00)											
		2012			2021			2026			2041		
		veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C
A452 (Chester Road) between Birmingham Business Park Roundabout and Coleshill Heath Road	SEB	1207	75	75.9%	1459	90	91.8%	1528	94	96.1%	1806	111	113.6%
	NWB	464	29	29.2%	561	35	35.3%	588	36	37.0%	694	43	43.7%
M42 junction 6 northbound off slip	NB	2082	121	57.8%	2180	127	60.6%	2190	127	60.8%	2333	136	64.8%
M42 junction 6 southbound on slip	SB	1415	82	39.3%	1482	86	41.2%	1488	86	41.3%	1586	92	44.0%
A45 west of Damson Parkway	EB	1933	119	53.7%	2157	133	59.9%	2204	136	61.2%	2270	140	63.1%
	WB	1661	103	46.1%	1853	114	51.5%	1894	117	52.6%	1951	120	54.2%
A45 between Damson Parkway an Clock junction	EB	1984	122	55.1%	2213	137	61.5%	2262	140	62.8%	2330	144	64.7%
	WB	1949	120	54.1%	2174	134	60.4%	2222	137	61.7%	2289	141	63.6%
A45 between Clock junction and M42 junction 6	EB	1835	113	32.8%	2048	126	36.6%	2093	129	37.4%	2155	133	38.5%
	WB	2955	182	52.8%	3297	204	58.9%	3370	208	60.2%	3470	214	62.0%
Link from M42 northbound to M6 northbound	NB	1010	59	25.2%	1049	61	26.2%	1054	61	26.4%	1126	65	28.2%
Link Road from M42 northbound to M6 eastbound	-	880	51	44.0%	914	53	45.7%	918	53	45.9%	981	57	49.0%
Link road between M6 westbound and M42 southbound	WB	685	40	17.1%	712	41	17.8%	715	42	17.9%	764	44	19.1%
M42 north of link road to M6 eastbound	NB	2437	142	43.5%	2531	147	45.2%	2544	148	45.4%	2717	158	48.5%

Location	Dir	AM peak (08:00-09:00)											
		2012			2021			2026			2041		
		veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C
M42 north of link road to M6 eastbound	SB	4437	258	79.2%	4609	268	82.3%	4633	269	82.7%	4948	288	88.3%
M6 west of junction 4	SB	2661	155	47.5%	2764	161	49.4%	2778	161	49.6%	2967	172	53.0%
	NB	3247	189	58.0%	3373	196	60.2%	3390	197	60.5%	3621	210	64.7%
M6 east of junction 4	EB	2996	174	53.5%	3112	181	55.6%	3128	182	55.9%	3340	194	59.6%
	WB	3391	197	60.6%	3523	205	62.9%	3541	206	63.2%	3781	220	67.5%
M6 south bound off slip at junction 4	SB	933	54	25.9%	969	56	26.9%	974	57	27.1%	1040	60	28.9%
M6 junction 4 on slip	EB	414	24	11.5%	430	25	11.9%	432	25	12.0%	462	27	12.8%
M6 junction 4 on slip	WB	441	26	12.3%	458	27	12.7%	460	27	12.8%	492	29	13.7%
M6 junction WB traffic approaching roundabout	WB	572	33	10.2%	594	35	10.6%	597	35	10.7%	638	37	11.4%
M6 junction 4 through junction traffic	WB	2134	124	38.1%	2217	129	39.6%	2228	129	39.8%	2380	138	42.5%
A452 (Kenilworth Road) south of Stonebridge Island	NB	1044	64	29.0%	1165	72	32.4%	1190	73	33.1%	1226	76	34.1%
	SB	1239	76	34.4%	1382	85	38.4%	1413	87	39.2%	1455	90	40.4%
A452 (Chester Road) north of junction with A446	NB	785	48	21.8%	876	54	24.3%	895	55	24.9%	922	57	25.6%
	SB	727	45	20.2%	811	50	22.5%	829	51	23.0%	854	53	23.7%
A446 Slips from Birmingham Business Park Roundabout	EB	126	8	3.8%	141	9	4.2%	144	9	4.3%	148	9	4.4%
	WB	668	41	19.9%	745	46	22.2%	762	47	22.7%	784	48	23.4%
A446 between Coleshill Heath	SB	1206	74	33.5%	1345	83	37.4%	1375	85	38.2%	1416	87	39.3%

Location	Dir	AM peak (08:00-09:00)											
		2012			2021			2026			2041		
		veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C
Road and M6 junction 4	NB	1199	74	33.3%	1338	83	37.2%	1367	84	38.0%	1408	87	39.1%
A446 between Coleshill Heath Road and Coventry Road	NB	1294	80	35.9%	1444	89	40.1%	1476	91	41.0%	1520	94	42.2%
	SB	1562	96	43.4%	1743	108	48.4%	1781	110	49.5%	1834	113	51.0%
Chester Road west of Coleshill Heath Road	EB	1187	73	37.1%	1435	89	44.8%	1503	93	47.0%	1776	110	55.5%
	WB	852	53	26.6%	1030	64	32.2%	1079	67	33.7%	1275	79	39.8%

Table 8-42: Strategic road network PM peak hour traffic flows 2021, 2026 and 2041(vehicles)

Location	Dir	PM peak (17:00-18:00)											
		2012			2021			2026			2041		
		veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C
A446 (Stonebridge Road) between M6 junction 4 and slips to A452	NB	1662	77	46.2%	2027	94	56.3%	2064	96	57.3%	2094	97	58.2%
	SB	1411	66	39.2%	1720	80	47.8%	1752	81	48.7%	1778	83	49.4%
A452 (Chester Road) between Birmingham Business Park Roundabout and Melbicks	SB	949	44	26.4%	1157	54	32.1%	1179	55	32.7%	1196	56	33.2%
	NB	495	23	13.8%	604	28	16.8%	615	29	17.1%	624	29	17.3%
A446 north of A452 slips	NB	1110	52	61.7%	1354	63	75.2%	1378	64	76.6%	1399	65	77.7%
	SB	1252	58	69.5%	1526	71	84.8%	1554	72	86.3%	1577	73	87.6%
A452 Between Packington Lane and Stonebridge Island	NB	1542	72	42.8%	1880	87	52.2%	1914	89	53.2%	1943	90	54.0%
	SB	2218	103	61.6%	2705	126	75.1%	2754	128	76.5%	2795	130	77.6%
A45 east of Stonebridge Island	EB	2267	105	63.0%	2765	128	76.8%	2815	131	78.2%	2857	133	79.4%

Location	Dir	PM peak (17:00-18:00)											
		2012			2021			2026			2041		
		veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C
	WB	2303	107	64.0%	2809	130	78.0%	2860	133	79.4%	2902	135	80.6%
A45 between M42 junction 6 and Stonebridge Island	EB	2404	112	42.9%	2932	136	52.4%	2986	139	53.3%	3030	141	54.1%
	WB	2982	139	53.3%	3637	169	65.0%	3704	172	66.1%	3758	175	67.1%
M42 south of junction 6	NB	5350	252	74.3%	5676	267	78.8%	5832	274	81.0%	6024	283	83.7%
	SB	5608	264	77.9%	5950	280	82.6%	6113	288	84.9%	6314	297	87.7%
M42 north of junction 6	NB	5567	262	77.3%	5906	278	82.0%	6068	286	84.3%	6268	295	87.1%
	SB	4986	235	69.3%	5290	249	73.5%	5435	256	75.5%	5614	264	78.0%
A452 (Chester Road) between Birmingham Business Park Roundabout and Coleshill Heath Road	SEB	614	29	38.6%	672	31	42.2%	685	32	43.1%	837	39	52.6%
	NWB	1094	51	68.8%	1197	56	75.3%	1221	57	76.8%	1491	69	93.8%
M42 junction 6 northbound off slip	NB	1409	66	39.1%	1494	70	41.5%	1531	72	42.5%	1557	73	43.3%
M42 junction 6 southbound on slip	SB	1864	88	51.8%	1976	93	54.9%	2026	95	56.3%	2060	97	57.2%
A45 west of Damson Parkway	EB	1986	92	55.2%	2422	113	67.3%	2466	115	68.5%	2503	116	69.5%
	WB	2127	99	59.1%	2594	120	72.1%	2641	123	73.4%	2680	125	74.5%
A45 between Damson Parkway an Clock junction	EB	2014	94	55.9%	2456	114	68.2%	2501	116	69.5%	2538	118	70.5%
	WB	2469	115	68.6%	3011	140	83.6%	3066	142	85.2%	3111	145	86.4%
A45 between Clock junction and M42 junction 6	EB	3033	141	54.2%	3700	172	66.1%	3767	175	67.3%	3823	178	68.3%
	WB	2894	134	51.7%	3530	164	63.0%	3594	167	64.2%	3647	169	65.1%

Location	Dir	PM peak (17:00-18:00)											
		2012			2021			2026			2041		
		veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C
Link from M42 northbound to M6 northbound	NB	1147	54	28.7%	1217	57	30.4%	1250	59	31.2%	1291	61	32.3%
Link Road from M42 northbound to M6 eastbound	-	838	39	41.9%	890	42	44.5%	914	43	45.7%	944	44	47.2%
Link road between M6 westbound and M42 southbound	WB	728	34	18.2%	773	36	19.3%	794	37	19.8%	820	39	20.5%
M42 north of link road to M6 eastbound	NB	3708	174	66.2%	3934	185	70.2%	4041	190	72.2%	4175	196	74.5%
M42 north of link road to M6 eastbound	SB	4161	196	74.3%	4414	208	78.8%	4536	213	81.0%	4685	220	83.7%
M6 west of junction 4	SB	2989	141	53.4%	3171	149	56.6%	3258	153	58.2%	3366	158	60.1%
	NB	3523	166	62.9%	3738	176	66.8%	3841	181	68.6%	3967	187	70.8%
M6 east of junction 4	EB	3530	166	63.0%	3745	176	66.9%	3848	181	68.7%	3975	187	71.0%
	WB	3138	148	56.0%	3329	157	59.5%	3421	161	61.1%	3533	166	63.1%
M6 south bound off slip at junction 4	SB	793	37	22.0%	842	40	23.4%	865	41	24.0%	893	42	24.8%
M6 junction 4 on slip	EB	708	33	19.7%	751	35	20.9%	772	36	21.4%	797	38	22.1%
M6 junction 4 on slip	WB	669	31	18.6%	710	33	19.7%	729	34	20.3%	753	35	20.9%
M6 junction WB traffic approaching roundabout	WB	387	18	6.9%	411	19	7.3%	422	20	7.5%	436	21	7.8%
M6 junction 4 through junction traffic WB	WB	2023	95	36.1%	2146	101	38.3%	2205	104	39.4%	2277	107	40.7%
A452 (Kenilworth Road) south of	NB	1102	51	30.6%	1344	62	37.3%	1369	64	38.0%	1389	65	38.6%

Location	Dir	PM peak (17:00-18:00)											
		2012			2021			2026			2041		
		veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C
Stonebridge Island	SB	1315	61	36.5%	1604	74	44.5%	1633	76	45.4%	1657	77	46.0%
A452 (Chester Road) north of junction with A446	NB	495	23	13.8%	604	28	16.8%	615	29	17.1%	624	29	17.3%
	SB	916	43	25.4%	1117	52	31.0%	1137	53	31.6%	1154	54	32.0%
A446 Slips from Birmingham Business Park Roundabout	EB	579	27	17.3%	706	33	21.1%	719	33	21.5%	730	34	21.8%
	WB	159	7	4.7%	194	9	5.8%	197	9	5.9%	200	9	6.0%
A446 between Coleshill Heath Road and M6 junction 4	SB	1050	49	29.2%	1281	59	35.6%	1304	61	36.2%	1323	61	36.8%
	NB	1659	77	46.1%	2023	94	56.2%	2060	96	57.2%	2091	97	58.1%
A446 between Coleshill Heath Road and Coventry Road	NB	1621	75	45.0%	1977	92	54.9%	2013	94	55.9%	2043	95	56.7%
	SB	1165	54	32.4%	1421	66	39.5%	1447	67	40.2%	1468	68	40.8%
Chester Road west of Coleshill Heath Road	EB	711	33	22.2%	778	36	24.3%	793	37	24.8%	969	45	30.3%
	WB	1350	63	42.2%	1477	69	46.2%	1506	70	47.1%	1840	85	57.5%

Table 8-43: Local road network AM peak hour traffic flows 2021, 2026 and 2041 (vehicles)

Location	Dir	AM peak (08:00-09:00)											
		2012			2021			2026			2041		
		veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C
A45 westbound service road between Stonebridge Island and east Way	WB	146	4	6.3%	260	6	11.3%	255	6	11.1%	260	6	11.3%

Location	Dir	AM peak (08:00-09:00)											
		2012			2021			2026			2041		
		veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C
A45 westbound service road between east Way and M42 junction 6	WB	110	3	4.8%	196	5	8.5%	192	5	8.4%	196	5	8.5%
east Way on link from A45 slip after Diddington Lane	NB	27	1	3.6%	48	1	6.4%	47	1	6.3%	48	1	6.4%
east Way	EB	73	2	2.9%	129	3	5.1%	126	3	5.0%	129	3	5.1%
east Way link to A45 eastbound off slip at Stonebridge Island	EB	93	2	12.4%	165	4	22.1%	162	4	21.6%	165	4	22.1%
south Way between M42 junction 6 and Pendigo Way	NB	406	12	12.7%	491	15	15.3%	514	16	16.1%	608	18	19.0%
	SB	138	4	4.3%	167	5	5.2%	175	5	5.5%	206	6	6.5%
Northway between north Avenue and north Car Park roundabout	NB	291	9	12.7%	352	11	15.3%	368	11	16.0%	435	13	18.9%
	SB	189	6	8.2%	228	7	9.9%	239	7	10.4%	283	9	12.3%
B4438 between Northway and Birmingham Business Park Roundabout	NB	589	18	18.4%	712	22	22.3%	746	23	23.3%	881	27	27.5%
	SB	499	15	15.6%	603	18	18.9%	632	19	19.7%	747	23	23.3%
Solihull Parkway	EB	111	3	3.5%	134	3	4.2%	141	3	4.4%	166	4	5.2%
	WB	1533	38	47.9%	1853	46	57.9%	1941	48	60.7%	2294	57	71.7%
Bickenhill Parkway west of Holiday Inn	EB	394	12	12.3%	476	14	14.9%	499	15	15.6%	590	18	18.4%
	WB	391	12	12.2%	473	14	14.8%	495	15	15.5%	585	18	18.3%

Location	Dir	AM peak (08:00-09:00)											
		2012			2021			2026			2041		
		veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C
Bickenhill Lane between Starlet Way and Morris Way	NB	1001	30	31.3%	1210	37	37.8%	1267	38	39.6%	1498	45	46.8%
	SB	790	24	24.7%	955	29	29.8%	1000	30	31.3%	1182	36	36.9%
Station Link Road between Trinity Park and Bickenhill Lane	EB	693	21	47.1%	838	25	57.0%	877	27	59.7%	1037	31	70.5%
	WB	233	7	15.9%	282	9	19.2%	295	9	20.1%	349	11	23.7%
Bickenhill Lane between Station Link Road and Clock junction	NB	1104	33	34.5%	1335	40	41.7%	1398	42	43.7%	1652	50	51.6%
	SB	808	25	25.3%	977	30	30.5%	1023	31	32.0%	1209	37	37.8%
Link from A45 slip to Bickenhill Lane	NB	419	13	41.1%	507	15	49.7%	531	16	52.0%	627	19	61.5%
Airport Way between Viking Road and Bickenhill Lane	EB	406	12	12.7%	491	15	15.3%	514	16	16.1%	608	18	19.0%
	WB	266	8	8.3%	322	10	10.0%	337	10	10.5%	398	12	12.4%
A45 eastbound on slip from Airport roundabout	EB	308	19	30.2%	344	21	33.7%	351	22	34.4%	362	22	35.5%
A45 westbound off slip to Airport Roundabout	WB	630	39	19.7%	703	43	22.0%	718	44	22.4%	740	46	23.1%
Airport Way between Viking Road and Hermes Road	NB	606	15	18.9%	733	18	22.9%	767	19	24.0%	907	23	28.3%
	SB	498	12	15.6%	602	15	18.8%	631	16	19.7%	745	19	23.3%
Coleshill Heath Road between Chester Road and Yorkminster Drive	NB	378	11	30.0%	457	14	36.3%	479	15	38.0%	566	17	44.9%
	SB	615	19	48.8%	744	23	59.0%	779	24	61.8%	920	28	73.0%

Table 8-44: Local road network PM peak hour traffic flows 2021, 2026 and 2041 (vehicles)

Location	Dir	PM peak (17:00-18:00)											
		2012			2021			2026			2041		
		veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C
A45 westbound service road between Stonebridge Island and east Way	WB	116	2	5.0%	143	2	6.2%	145	2	6.3%	201	3	8.8%
A45 westbound service road between east Way and M42 junction 6	WB	74	1	3.2%	91	2	4.0%	92	2	4.0%	128	2	5.6%
east Way on link from A45 slip after Diddington Lane	NB	27	0	3.6%	33	1	4.4%	34	1	4.5%	47	1	6.3%
east Way	EB	73	1	2.9%	90	2	3.6%	92	2	3.6%	127	2	5.0%
east Way link to A45 eastbound off slip at Stonebridge Island	EB	104	2	13.9%	129	2	17.1%	131	2	17.4%	181	3	24.1%
south Way between M42 junction 6 and Pendigo Way	NB	244	5	7.6%	267	6	8.3%	272	6	8.5%	333	7	10.4%
	SB	254	5	7.9%	278	6	8.7%	283	6	8.9%	346	7	10.8%
Northway between north Avenue and north Car Park roundabout	NB	301	6	13.1%	329	7	14.3%	336	7	14.6%	410	9	17.8%
	SB	112	2	4.9%	123	3	5.3%	125	3	5.4%	153	3	6.6%
B4438 between Northway and Birmingham Business Park Roundabout	NB	576	12	18.0%	630	13	19.7%	643	14	20.1%	785	17	24.5%
	SB	439	9	13.7%	480	10	15.0%	490	10	15.3%	598	13	18.7%
Solihull Parkway	EB	1311	22	41.0%	1434	24	44.8%	1463	24	45.7%	1787	30	55.8%
	WB	94	2	2.9%	103	2	3.2%	105	2	3.3%	128	2	4.0%

Location	Dir	PM peak (17:00-18:00)											
		2012			2021			2026			2041		
		veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C	veh	HGV	V/C
Bickenhill Parkway west of Holiday Inn	EB	402	9	12.6%	440	9	13.7%	449	10	14.0%	548	12	17.1%
	WB	372	8	11.6%	407	9	12.7%	415	9	13.0%	507	11	15.8%
Bickenhill Lane between Starlet Way and Morris Way	NB	1094	23	34.2%	1197	26	37.4%	1221	26	38.1%	1491	32	46.6%
	SB	780	17	24.4%	853	18	26.7%	870	19	27.2%	1063	23	33.2%
Station Link Road between Trinity Park and Bickenhill Lane	EB	177	4	12.0%	194	4	13.2%	198	4	13.4%	241	5	16.4%
	WB	741	16	50.4%	811	17	55.1%	827	18	56.2%	1010	22	68.7%
Bickenhill Lane between Station Link Road and Clock junction	NB	588	13	18.4%	643	14	20.1%	656	14	20.5%	802	17	25.0%
	SB	1661	35	51.9%	1817	39	56.8%	1853	40	57.9%	2264	48	70.8%
Link from A45 slip to Bickenhill Lane	NB	352	8	34.5%	385	8	37.8%	393	8	38.5%	480	10	47.0%
Airport Way between Viking Road and Bickenhill Lane	EB	700	15	21.9%	766	16	23.9%	781	17	24.4%	954	20	29.8%
	WB	313	7	9.8%	342	7	10.7%	349	7	10.9%	427	9	13.3%
A45 eastbound on slip from Airport roundabout	EB	747	35	41.5%	911	42	50.6%	928	43	51.5%	941	44	52.3%
A45 westbound off slip to Airport Roundabout	WB	668	31	37.1%	815	38	45.3%	830	39	46.1%	842	39	46.8%
Airport Way between Viking Road and Hermes Road	NB	781	13	24.4%	854	14	26.7%	872	15	27.2%	1065	18	33.3%
	SB	1005	17	31.4%	1099	18	34.4%	1121	19	35.0%	1370	23	42.8%
Coleshill Heath Road between Chester Road and Yorkminster Drive	NB	526	11	41.7%	575	12	45.7%	587	13	46.6%	717	15	56.9%
	SB	535	11	42.5%	585	13	46.4%	597	13	47.4%	729	16	57.9%

8.4.51 Table 8-44 above shows flows for the main local roads in the area. Table 8-44 shows that the level of flows forecast are expected to be well within the capacity of the roads even in the future years. Again, the impact of these changes has been assessed in the VISSIM model which is reported below.

Network modelling

8.4.52 The Birmingham Interchange VISSIM described earlier in the report has been used to assess the changes in network conditions in the area as a result of future traffic growth and will also be used to assess the impacts of the Proposed Scheme. This section provides a summary of:

- the future baseline conditions in the local area and considers overall network performance;
- operation of the main junctions in the area in terms of junction queues, junction journey times and junction throughputs for M42 junction 6, M6 junction 4, Stonebridge Island, A45 Coventry Road/Damson Parkway, A452 Chester Road/B448 Bickenhill Parkway, A45 Coventry Road/B4438 Catherine-de-Barnes Lane and A452 Chester Road/Coleshill Heath Road roundabout; and
- travel times on the M42, A45, A452 and A446.

Network performance

8.4.53 The VISSIM model is able to provide a number of measures of network performance including:

- Average delay time per vehicle
- Average number of stops per vehicles
- Average speed
- Average stopped delay per vehicle
- Total delay time
- Total Distance Travelled [km]
- Number of Stops
- Number of vehicles in the network
- Number of vehicles that have left the network
- Total stopped delay [h]
- Total travel time [h]
- Unreleased Vehicles

8.4.54 Table 8-45 summarises the performance of the network for the AM peak hour.

Table 8-45: Birmingham Interchange area VISSIM model AM peak hour network performance indicators - 2012, 2026, 2041 future baseline (no Proposed Scheme)

Parameter	AM peak (08:00-09:00)		
	2012	2026	2041
Average delay time per vehicle [s], All Vehicle Types	43.8	74.8	144.0
Average number of stops per vehicles, All Vehicle Types	1	1	3
Average speed [mph], All Vehicle Types	44.2	37.7	31.2
Average stopped delay per vehicle [s], All Vehicle Types	10	15	25
Total delay time [h], All Vehicle Types	371	760	1576
Total Distance Travelled [km], All Vehicle Types	193007	215714	226483
Number of Stops, All Vehicle Types	23156	52061	122700
Number of vehicles in the network, All Vehicle Types	2707	3663	4977
Number of vehicles that have left the network, All Vehicle Types	27734	32915	34421
Total stopped delay [h], All Vehicle Types	82	156	278
Total travel time [h], All Vehicle Types	2712	3558	4513
Unreleased Vehicles	0	158	1921

8.4.55 Table 8-45 shows that average delays are expected to increase by 2026 by 71% and a further 93% between 2026 and 2041. This results in a reduction in the AM peak hour average vehicle speeds by 6.5mph to 37.7mph from 2012 to 2026 and a reduction in a further reduction in AM peak hour average vehicle speeds by 6.5mph to 31.2mph from 2026 to 2041.

8.4.56 These changes arise as a result of the increased demand for travel through the network. The table above shows that by 2026, the throughput of the network increases by 20% and a further 8% by 2041. A further consequence of the increased demand and increased delays is that the number of unreleased vehicles increases. In 2012, all of the demand is able to enter the network during the peak hour. By 2026, 0.4% of the demand is unable to enter the network and this increases to 4.6% by 2041.

8.4.57 This indicates that the network is approaching capacity at peak time which will result in peak spreading. Table 8-46 summarises the locations at which vehicles are unreleased in 2026 and 2041 in the AM peak hour.

Table 8-46: Birmingham Interchange area VISSIM model AM peak hour unreleased vehicles - 2026, 2041 future baseline (no Proposed Scheme)

	2026		2041	
AM peak	Unreleased vehicles	Proportion of demand	Unreleased vehicles	Proportion of demand
A45 Coventry Rd west of Damson Parkway (EB)	157	6.9%	617	23.9%
Damson Parkway	1	0.1%	-	-
Viking Way	3	1.2%	-	-

	2026		2041	
AM peak	**Unreleased vehicles**	**Proportion of demand**	**Unreleased vehicles**	**Proportion of demand**
M6 east	-	-	609	12.9%
A446 Stonebridge Road north (SB)	-	-	69	4.1%
A452 Chester Road north (SB)	-	-	20	1.3%
Chelmsley Road	-	-	1	0.3%
M42 north (SB)	-	-	610	9.1%

8.4.58 Table 8-46 shows that in the AM peak hour there are only a limited number of locations in which the model is unable to assign the total demand with the most substantial being the A45 Coventry Road EB approach to the junction with Damson Parkway. By 2041 the number of locations increases with an increased proportion of trips from the A45 Coventry Road EB approach unable to enter the network, but also demands from both the M6 east and M42 north that are also unable to enter the network.

8.4.59 Table 8-47 summarises the performance of the network for the PM peak hour.

Table 8-47: Birmingham Interchange area VISSIM model PM peak hour network performance indicators - 2012, 2026, 2041 future baseline (no Proposed Scheme)

Parameter	**PM peak (17:00-18:00)**		
	2012	**2026**	**2041**
Average delay time per vehicle [s], All Vehicle Types	41.9	87.9	162.3
Average number of stops per vehicles, All Vehicle Types	1	2	4.5
Average speed [mph], All Vehicle Types	44.3	37.0	30.4
Average stopped delay per vehicle [s], All Vehicle Types	10	23	37
Total delay time [h], All Vehicle Types	394	980	1955
Total Distance Travelled [km], All Vehicle Types	214581	241202	251987
Number of Stops, All Vehicle Types	25182	92882	195243
Number of vehicles in the network, All Vehicle Types	3065	4603	5880
Number of vehicles that have left the network, All Vehicle Types	30778	35515	37483
Total stopped delay [h], All Vehicle Types	95	260	449
Total travel time [h], All Vehicle Types	3011	4047	5158
Unreleased Vehicles	0	601	3422

8.4.60 Table 8-47 shows a similar pattern to the AM peak hour. Table 8-47 shows that average delays are expected to increase by 2026 by 110% and a further 85% between 2026 and 2041. This results in a reduction in the PM peak hour average vehicle speeds by 7.3mph to 37.0mph from 2012 to 2026 and a reduction in a further reduction in PM peak hour average vehicle speeds by 6.6mph to 30.4mph from 2026 to 2041. These changes arise as a result of the increased demand for travel through the network. Table 8-47 shows that by 2026, the throughput of the network increases by 19% and a further 8% by 2041. A further consequence of the increased demand and increased delays is that the number of unreleased vehicles increases. In 2012, all of the demand is able to enter the network during the peak hour. By 2026, 1.5% of the demand is unable to enter the network and this increases to 7.3% by 2041. This again indicates that the network is approaching capacity at peak time. Table 8-48 summarises the locations at which vehicles are unreleased in 2026 and 2041 in the PM peak hour.

Table 8-48: Birmingham Interchange area VISSIM model PM peak hour unreleased vehicles - 2026, 2041 future baseline (no Proposed Scheme)

	2026		**2041**	
	Unreleased vehicles	**Proportion of demand**	**Unreleased vehicles**	**Proportion of demand**
A45 Coventry Rd west of Damson Parkway (EB)	-	-	159	6.0%
Damson Parkway	29	3.9%	183	21.8%
M42 south (NB)	494	7.4%	1698	22.7%
Solihull Business Park	320	21.5%	172	9.9%
Motorcycle Museum Exit	76	74.2%	111	93.7%
M42 north (SB)	1	0.0%	579	8.4%
Terminal Way	-	-	18	5.2%
Kenilworth Rd (NB)	-	-	1	0.1%
A45 Birmingham Rd east (WB)	-	-	298	9.6%
Station Link Road	-	-	52	4.3%
M6 east	-	-	248	5.7%

8.4.61 Table 8-48 shows that in the PM peak hour there are more locations where the model is unable to assign the total demand. In particular, in 2041, the proportion of trips which are unable to enter the network on the M42 approaches increases. This in part is due to the operation of M42 junction 6 as the above table shows that the majority of demand from the Motorcycle Museum is unable to enter the network indicating that the operation of the junction is problematic. It is likely that this is having a knock-on impact to the mainline operation of the M42 in 2041. Junction performance is discussed in more detail below.

8.4.62 In summary, the analysis shows that by 2041 there will be increased congestion and delays resulting in reduced vehicle speeds and an increased proportion of vehicles unable to complete journeys in the both the AM and PM peak hours.

Junction performance

M42 junction 6

8.4.63 Table 8-49 shows the flow and maximum queues at M42 junction 6 in the weekday AM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-49: M42 junction 6 AM peak hour queue lengths (metres) - 2012, 2026, 2041 future baseline (no Proposed Scheme)

M42 junction 6	AM peak (08:00-09:00)					
	2012		2026		2041	
	Flow (veh)	Max queue	Flow (veh)	Max queue	Flow (veh)	Max queue
M42 north off-slip	1519	89	1774	88	1680	94
A45 Coventry Road east off-slip	1053	82	1357	127	1537	506
National Motorcycle Museum*	n/a	n/a	n/a	n/a	n/a	n/a
M42 south off-slip	1849	77	2328	143	2449	1728
A45 Coventry Road west off-slip	1057	63	1648	94	1712	97
south Way - Left Turn	237	43	464	45	485	46
south Way - Ahead		48		62		58

* minor access - peak hour flows are low and not reported

8.4.64 Table 8-50 shows the flow and maximum queues at M42 junction 6 in the weekday PM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-50: M42 junction 6 PM peak hour queue lengths (metres) - 2012, 2026, 2041 future baseline (no Proposed Scheme)

M42 junction 6	PM peak (17:00-18:00)					
	2012		2026		2041	
	Flow (veh)	Max queue	Flow (veh)	Max queue	Flow (veh)	Max queue
M42 north off-slip	1366	79	1742	485	1754	3436
A45 Coventry Road east off-slip	1529	91	2025	1156	2073	1518
National Motorcycle Museum*	n/a	n/a	n/a	n/a	n/a	n/a
M42 south off-slip	1365	51	1746	3076	1713	3083
A45 Coventry Road west off-slip	1725	123	2200	135	2465	153
south Way - Left Turn	413	43	554	58	564	173
south Way - Ahead		48		68		181

* minor access - peak hour flows are low and not reported

8.4.65 Table 8-49 and Table 8-50 show that in the AM peak hour the junction is expected to be able to accommodate the forecasts queues in 2026 in the available storage space but that by 2041 queues on the M42 south off-slip are forecast to extend beyond the length of slip-road.

8.4.66 In the PM peak hour the junction is expected to see substantial queues on a number of approaches by 2026 and queues continuing to increase by 2041. The impact of these increases is that they have a consequential impact on downstream junctions and flow of mainline operation on the M42 and the A45 Coventry Road.

8.4.67 Table 8-51 considers the operation of M42 junction 6 in terms of average journey times/delays and junction throughput the weekday AM peak hour.

Table 8-51: M42 junction 6 AM peak hour average journey times (seconds) and throughput - 2012, 2026, 2041 future baseline (no Proposed Scheme)

M42 junction 6	**AM peak (08:00-09:00)**		
	2012	**2026**	**2041**
Junction throughput (vehicles)	5715	7571	7864
Average travel time per vehicle (seconds)	75	92	126

8.4.68 Table 8-52 shows the operation of M42 junction 6 in terms of average journey times/delays and junction throughput the weekday PM peak hour.

Table 8-52: M42 junction 6 PM peak hour average journey times (seconds) and throughput - 2012, 2026, 2041 future baseline (no Proposed Scheme)

M42 junction 6	**PM peak (17:00-18:00)**		
	2012	**2026**	**2041**
Junction throughput (vehicles)	6398	8267	8569
Average travel time per vehicle (seconds)	82	140	165

8.4.69 Table 8-51 and Table 8-52 shows that average journey times through the junction are forecast to increase by around 23% by 2026 and a further 37% by 2041 in the AM peak hour and by around 72% by 2026 and a further 21% by 2041 in the PM peak hour. It should also be noted that junction throughput is expected to increase by around 33% by 2026 and a further 4% by 2041 in the AM peak hour and by around 29% by 2026 and a further 4% by 2041 in the PM peak hour. The analysis shows the ability for the junction to accommodate increased throughput but also shows that by 2041 the growth in demand is more limited due to wider congestion on the network which results in average delays increasing and increased journey times and queues.

M6 junction 4

8.4.70 Table 8-53 below shows the flow and maximum queues at M6 junction 4 in the weekday AM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-53: M6 junction 4 AM peak hour queue lengths (metres) - 2012, 2026, 2041 future baseline (no Proposed Scheme)

M6 junction 4	AM peak (08:00-09:00)					
	2012		2026		2041	
	Flow (veh)	Max queue	Flow (veh)	Max queue	Flow (veh)	Max queue
A446 Stonebridge Road (north)	1148	72	1200	382	1130	382
M6 east off-slip	575	83	699	136	639	139
A446 Stonebridge Road (south)	1209	137	1213	35	1341	38
M6 west off-slip	1111	121	1401	161	1473	965

8.4.71 Table 8-54 shows the flow and maximum queues at M6 junction 4 in the weekday PM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-54: M6 junction 4 PM peak hour queue lengths (metres) - 2012, 2026, 2041 future baseline (no Proposed Scheme)

M6 junction 4	PM peak (17:00-18:00)					
	2012		2026		2041	
	Flow (veh)	Max queue	Flow (veh)	Max queue	Flow (veh)	Max queue
A446 Stonebridge Road (north)	1052	90	1192	73	1322	112
M6 east off-slip	258	41	504	66	538	73
A446 Stonebridge Road (south)	1765	119	1843	105	1982	184
M6 west off-slip	957	309	1221	149	1210	1119

8.4.72 Table 8-54 shows that in the AM peak hour the junction is expected to be able to accommodate the forecast queues in 2026 in the available storage space although queues begin to develop on the A446 Stonebridge Road (north) approach to the junction. By 2041 queues develop on the M6 west off-slip however due to the length of this slip, queues are able to be contained on the slip without affecting the flow of the M6 mainline.

8.4.73 In the PM peak hour, the most substantial queues are again seen on the M6 west off-slip but are again contained on the slip without affecting the flow of the M6 mainline.

8.4.74 Table 8-55 considers the operation of M6 junction 4 in terms of average journey times/delays and junction throughput the weekday AM peak hour.

Table 8-55: M6 junction 4 AM peak hour average journey times (seconds) and throughput - 2012, 2026, 2041 future baseline (no Proposed Scheme)

M6 junction 4	AM peak (08:00-09:00)		
	2012	2026	2041
Junction throughput (vehicles)	4042	4513	4583
Average travel time per vehicle (seconds)	38	45	66

8.4.75 Table 8-56 shows the operation of M6 junction 4 in terms of average journey times/delays and junction throughput the weekday PM peak hour.

Table 8-56: M6 junction 4 PM peak hour average journey times (seconds) and throughput - 2012, 2026, 2041 future baseline (no Proposed Scheme)

M6 junction 4	PM peak (17:00-18:00)		
	2012	2026	2041
Junction throughput (vehicles)	4032	4760	5052
Average travel time per vehicle (seconds)	51	45	59

8.4.76 Table 8-56 shows that average journey times through the junction are forecast to increase by around 18% by 2026 and a further 47% by 2041 in the AM peak hour and reduce by around 11% by 2026 but increase by a 31% by 2041 in the PM peak hour. The junction throughput is expected to increase by around 12% by 2026 and a further 2% by 2041 in the AM peak hour and by around 18% by 2026 and a further 6% by 2041 in the PM peak hour. The reduction in the PM peak is likely to be a result of a combination of increased throughput through the junction with a different turning demand resulting in reduced delay.

Stonebridge Island

8.4.77 Table 8-57 shows the flow and maximum queues at Stonebridge Island in the weekday AM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-57: Stonebridge Island AM peak hour queue lengths (metres) - 2012, 2026, 2041 future baseline (no Proposed Scheme)

Stonebridge Island	AM peak (08:00-09:00)					
	2012		2026		2041	
	Flow (veh)	Max queue	Flow (veh)	Max queue	Flow (veh)	Max queue
A452 Chester Road	1875	168	2080	330	2091	350
A45 east off-slip	426	119	272	102	299	158
A452 Kenilworth Road	1045	63	1185	76	1381	91
A45 west off-slip - left turn	1388	339	1409	154	1467	377
A45 west off-slip - ahead		339		175		376

8.4.78 Table 8-58 shows the flow and maximum queues at Stonebridge Island in the weekday PM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-58: Stonebridge Island PM peak hour queue lengths (metres) - 2012, 2026, 2041 future baseline (no Proposed Scheme)

Stonebridge Island	PM peak (17:00-18:00)					
	2012		2026		2041	
	Flow (veh)	Max queue	Flow (veh)	Max queue	Flow (veh)	Max queue
A452 Chester Road	1977	204	2308	317	2440	476
A45 east off-slip	434	88	292	61	319	83
A452 Kenilworth Road	1108	59	1115	74	1274	149

Stonebridge Island	PM peak (17:00-18:00)					
	2012		2026		2041	
	Flow (veh)	Max queue	Flow (veh)	Max queue	Flow (veh)	Max queue
A45 west off-slip - left turn	1126	190	1183	147	1201	218
A45 west off-slip - ahead		199		142		212

8.4.79 Table 8-57 and Table 8-58 above show that in the AM peak hour the junction is expected to be able to accommodate the forecast queues in 2026 and 2041 in the available storage space although queues begin to develop particularly on the A45 off-slips.

8.4.80 Similarly, in the PM peak hour, the junction is expected to be able to accommodate the forecast queues in 2026 and 2041 in the available storage space although queues begin to develop particularly on the A452 Chester Road.

8.4.81 Table 8-59 considers the operation of Stonebridge Island in terms of average journey times/delays and junction throughput the weekday AM peak hour.

Table 8-59: Stonebridge Island AM peak hour average journey times (seconds) and throughput - 2012, 2026, 2041 future baseline (no Proposed Scheme)

Stonebridge Island	AM peak (08:00-09:00)		
	2012	2026	2041
Junction throughput (vehicles)	4733	4946	5237
Average travel time per vehicle (seconds)	50	56	69

8.4.82 Table 8-60 shows the operation of Stonebridge Island in terms of average journey times/delays and junction throughput the weekday PM peak hour.

Table 8-60: Stonebridge Island PM peak hour average journey times (seconds) and throughput - 2012, 2026, 2041 future baseline (no Proposed Scheme)

Stonebridge Island	PM peak (17:00-18:00)		
	2012	2026	2041
junction throughput (vehicles)	4644	4897	5233
Average travel time per vehicle (seconds)	45	49	57

8.4.83 Table 8-59 and Table 8-60 show that average journey times through the junction are forecast to increase by around 12% by 2026 and a further 23% by 2041 in the AM peak hour and by around 9% by 2026 and a further 16% by 2041 in the PM peak hour. The junction throughput is expected to increase by around 5% by 2026 and a further 6% by 2041 in the AM peak hour and by around 6% by 2026 and a further 7% by 2041 in the PM peak hour.

A45 Coventry Road/Damson Parkway

8.4.84 Table 8-61 shows flow and maximum queues at the A45 Coventry Road/Damson Parkway traffic signal junction in the weekday AM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-61: A45 Coventry Road/Damson Parkway AM peak hour queue lengths (metres) - 2012, 2026, 2041 future baseline (no Proposed Scheme)

A45 Coventry Road/Damson Parkway	AM peak (08:00-09:00)					
	2012		2026		2041	
	Flow	Max queue	Flow	Max queue	Flow	Max queue
Terminal Road - Left Turn	158	87	188	99	221	141
Terminal Road - Ahead/ Right Turn		88		101		143
A45 Coventry Road (east) - Ahead	1863	103	2136	126	2299	178
A45 Coventry Road (east) - Right Turn		97		53		62
Damson Parkway - Left Turn	619	30	722	34	757	37
Damson Parkway - Ahead/Right Turn		148		280		492
A45 Coventry Road (west) - Ahead	1855	249	1979	1001	1966	1003
A45 Coventry Road (west) - Right Turn		204		69		64

8.4.85 Table 8-62 shows the flow and maximum queues at in the weekday PM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-62: A45 Coventry Road/Damson Parkway PM peak hour queue lengths (metres) - 2012, 2026, 2041 future baseline (no Proposed Scheme)

A45 Coventry Road/Damson Parkway	PM peak (17:00-18:00)					
	2012		2026		2041	
	Flow (veh)	Max queue	Flow (veh)	Max queue	Flow (veh)	Max queue
Terminal Road - Left Turn	231	106	268	161	265	193
Terminal Road - Ahead/ Right Turn		108		163		194
A45 Coventry Road (east) - Ahead	2421	146	2710	334	2831	385
A45 Coventry Road (east) - Right Turn		97		84		72
Damson Parkway - Left Turn	626	47	674	46	641	164
Damson Parkway - Ahead/Right Turn		96		644		645
A45 Coventry Road (west) - Ahead	1967	242	2339	451	2391	1001
A45 Coventry Road (west) - Right Turn		123		159		520

8.4.86 Table 8-61 and Table 8-62 above show that in the AM peak hour queues are forecast to develop on the A45 Coventry Road west approach to the junction.

8.4.87 In the PM peak hour queues are forecast to develop on the A45 Coventry Road west and Damson Parkway approaches to the junction.

8.4.88 Table 8-63 below considers the operation of the A45 Coventry Road/Damson Parkway traffic signal junction in terms of average journey times/delays and junction throughput the weekday AM peak hour.

Table 8-63; A45 Coventry Road/Damson Parkway AM peak hour average journey times (seconds) and throughput - 2012, 2026, 2041 future baseline (no Proposed Scheme)

A45 Coventry Road/Damson Parkway	**AM peak (08:00-09:00)**		
	2012	**2026**	**2041**
junction throughput (vehicles)	4495	5025	5243
Average travel Time per Vehicle (seconds)	48	68	76

8.4.89 Table 8-64 below shows the operation of the A45 Coventry Road/Damson Parkway traffic signal junction in terms of average journey times/delays and junction throughput the weekday PM peak hour.

Table 8-64: A45 Coventry Road/Damson Parkway PM peak hour average journey times (seconds) and throughput - 2012, 2026, 2041 future baseline (no Proposed Scheme)

A45 Coventry Road/Damson Parkway	**PM peak (17:00-18:00)**		
	2012	**2026**	**2041**
junction throughput (vehicles)	5245	5990	6129
Average travel time per vehicle (seconds)	44	64	75

8.4.90 Table 8-63 and Table 8-64 show that average journey times through the junction are forecast to increase by around 42% by 2026 and a further 12% by 2041 in the AM peak hour and by around 46% by 2026 and a further 17% by 2041 in the PM peak hour. The junction throughput is expected to increase by around 12% by 2026 and a further 4% by 2041 in the AM peak hour and by around 14% by 2026 and a further 3% by 2041 in the PM peak hour.

A452 Chester Road/B4438 Bickenhill Parkway

8.4.91 Table 8-65 shows the flow and maximum queues at the A452 Chester Road/B4438 Bickenhill Parkway roundabout junction (Birmingham Business Park) in the weekday AM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-65: A452 Chester Road/B4438 Bickenhill Parkway AM peak hour queue lengths (metres) - 2012, 2026, 2041 future baseline (no Proposed Scheme)

A452 Chester Road/B4438 Bickenhill Parkway	**AM peak (08:00-09:00)**					
	2012		**2026**		**2041**	
	Flow (veh)	**Max queue**	**Flow (veh)**	**Max queue**	**Flow (veh)**	**Max queue**
A446 north slips	677	71	955	105	927	114
A452 Chester Road south	852	103	768	188	830	173
B4438 Bickenhill Parkway	343	104	308	111	349	190
Solihull Parkway	108	10	136	10	163	13

A452 Chester Road/B4438 Bickenhill Parkway	AM peak (08:00-09:00)					
	2012		2026		2041	
	Flow (veh)	Max queue	Flow (veh)	Max queue	Flow (veh)	Max queue
A452 Chester Road north	1108	24	1245	30	1264	30

8.4.92 Table 8-66 below shows the flow and maximum queues at in the weekday PM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-66: A452 Chester Road/B4438 Bickenhill Parkway PM peak hour queue lengths (metres) - 2012, 2026, 2041 future baseline (no Proposed Scheme)

A452 Chester Road/B4438 Bickenhill Parkway	PM peak (17:00-18:00)					
	2012		2026		2041	
	Flow (veh)	Max queue	Flow (veh)	Max queue	Flow (veh)	Max queue
A446 north slips	123	19	170	22	170	32
A452 Chester Road south	485	27	616	75	621	67
B4438 Bickenhill Parkway	439	23	442	24	487	25
Solihull Parkway	1317	74	1479	184	1529	246
A452 Chester Road north	681	73	945	380	1001	1051

8.4.93 Table 8-65 and Table 8-66 show that in the AM peak hour there are not forecast to be any substantial queues at the junction. Queues develop on the A446 north slips, A452 Chester Road south and B4438 Bickenhill Parkway as a result of traffic accessing Birmingham Business Park but queues are contained in the available storage capacity

8.4.94 In the PM peak hour queues are forecast on the junction particularly on Solihull Parkway and the A452 Chester Road north.

8.4.95 Table 8-67 considers the operation of the A452 Chester Road/B4438 Bickenhill Parkway roundabout junction in terms of average journey times/delays and junction throughput the weekday AM peak hour.

Table 8-67: A452 Chester Road/B4438 Bickenhill Parkway AM peak hour average journey times (seconds) and throughput - 2012, 2026, 2041 future baseline (no Proposed Scheme)

A452 Chester Road/B4438 Bickenhill Parkway	AM peak (08:00-09:00)		
	2012	2026	2041
junction throughput (vehicles)	3411	3854	3998
Average travel time per Vehicle (seconds)	67	71	75

8.4.96 Table 8-68 shows the operation of the A452 Chester Road/B4438 Bickenhill Parkway roundabout junction in terms of average journey times/delays and junction throughput the weekday PM peak hour.

Table 8-68: A452 Chester Road/B4438 Bickenhill Parkway PM peak hour average journey times (seconds) and throughput - 2012, 2026, 2041 future baseline (no Proposed Scheme)

A452 Chester Road/B4438 Bickenhill Parkway	**PM peak (17:00-18:00)**		
	2012	**2026**	**2041**
junction Throughput (vehicles)	3251	3973	4123
Average Travel Time per Vehicle (seconds)	64	78	97

8.4.97 Table 8-67 and Table 8-68 show that average journey times through the junction are forecast to increase by around 6% by 2026 and a further 6% by 2041 in the AM peak hour and by around 22% by 2026 and a further 24% by 2041 in the PM peak hour. The junction throughput is expected to increase by around 13% by 2026 and a further 4% by 2041 in the AM peak hour and by around 22% by 2026 and a further 4% by 2041 in the PM peak hour.

A45 Coventry Road/B4438 Catherine-de-Barnes Lane

8.4.98 Table 8-69 shows the flow and maximum queues at the A45 Coventry Road/B4438 Catherine-de-Barnes Lane roundabout junction in the weekday AM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-69: A45 Coventry Road/B4438 Catherine-de-Barnes Lane AM peak hour queue lengths (metres) - 2012, 2026, 2041 future baseline (no Proposed Scheme)

A45 Coventry Road/B4438 Catherine-de-Barnes Lane	**AM peak (08:00-09:00)**					
	2012		**2026**		**2041**	
	Flow (veh)	**Max queue**	**Flow (veh)**	**Max queue**	**Flow (veh)**	**Max queue**
B4438 Bickenhill Lane	764	19	997	32	1155	57
A45 east off-slip	2291	60	2607	65	2774	84
B4438 Catherine De Barnes	599	45	715	50	783	50
A45 west off-slip	1569	12	1653	15	1703	17

8.4.99 Table 8-70 below shows the flow and maximum queues at in the weekday PM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-70: A45 Coventry Road/B4438 Catherine-de-Barnes Lane PM peak hour queue lengths (metres) - 2012, 2026, 2041 future baseline (no Proposed Scheme)

A45 Coventry Road/B4438 Catherine-de-Barnes Lane	**PM peak (17:00-18:00)**					
	2012		**2026**		**2041**	
	Flow (veh)	**Max queue**	**Flow (veh)**	**Max queue**	**Flow (veh)**	**Max queue**
B4438 Bickenhill Lane	2304	36	2080	14	2425	12
A45 east off-slip	435	89	2425	163	2419	194
B4438 Catherine De Barnes	1747	36	546	67	618	73
A45 west off-slip	1976	9	1937	43	1939	56

8.4.100 Table 8-69 and Table 8-70 show that in the AM peak hour there are no substantial queues forecast to develop on the junction.

8.4.101 In the PM peak hour queues develop on the A45 east off-slip however these are contained within the length of the off-slip and does not impact on the flow on the A45 Coventry Road mainline.

8.4.102 Table 8-71 considers the operation of the A45 Coventry Road/B4438 Catherine-de-Barnes Lane roundabout junction in terms of average journey times/delays and junction throughput the weekday AM peak hour.

Table 8-71: A45 Coventry Road/B4438 Catherine-de-Barnes Lane AM peak hour average journey times (seconds) and throughput - 2012, 2026, 2041 future baseline (no Proposed Scheme)

A45 Coventry Road/B4438 Catherine-de-Barnes Lane	**AM peak (08:00-09:00)**		
	2012	**2026**	**2041**
junction throughput (vehicles)	5223	5972	6415
Average travel time per vehicle (seconds)	22	23	23

8.4.103 Table 8-72 shows the operation of the A45 Coventry Road/B4438 Catherine-de-Barnes Lane roundabout junction in terms of average journey times/delays and junction throughput the weekday PM peak hour.

Table 8-72: A45 Coventry Road/B4438 Catherine-de-Barnes Lane PM peak hour average journey times (seconds) and throughput - 2012, 2026, 2041 future baseline (no Proposed Scheme)

A45 Coventry Road/B4438 Catherine-de-Barnes Lane	**PM peak (17:00-18:00)**		
	2012	**2026**	**2041**
junction throughput (vehicles)	6462	6988	7401
Average travel time per vehicle (seconds)	25	22	23

8.4.104 Table 8-71 and Table 8-72 show that there in minimal change average journey times through the junction. The junction throughput is expected to increase by around 14% by 2026 and a further 7% by 2041 in the AM peak hour and by around 8% by 2026 and a further 6% by 2041 in the PM peak hour.

A452 Chester Road/Coleshill Heath Road roundabout

8.4.105 Table 8-73 shows the flow and maximum queues at the A452 Chester Road/Coleshill Heath Road roundabout in the weekday AM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-73: A452 Chester Road/Coleshill Heath Road roundabout AM peak hour queue lengths (metres) - 2012, 2026, 2041 future baseline (no Proposed Scheme)

A452 Chester Road/Coleshill Heath Road	**AM peak (08:00-09:00)**					
	2012		**2026**		**2041**	
	Flow (veh)	**Max queue**	**Flow (veh)**	**Max queue**	**Flow (veh)**	**Max queue**
Coleshill Heath Road (north)	575	307	407	421	425	974

Chester Road (east)	626	45	777	75	818	36
Coleshill Heath Road (south)	272	95	530	77	570	103
Chester Road (west)	1156	98	1371	377	1300	1294

8.4.106 Table 8-74 shows the flow and maximum queues at in the weekday PM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-74: A452 Chester Road/Coleshill Heath Road PM peak hour queue lengths (metres) - 2012, 2026, 2041 future baseline (no Proposed Scheme)

A452 Chester Road/Coleshill Heath Road	**PM peak (17:00-18:00)**					
	2012		**2026**		**2041**	
	Flow (veh)	**Max queue**	**Flow (veh)**	**Max queue**	**Flow (veh)**	**Max queue**
Coleshill Heath Road (north)	660	117	787	217	778	594
A452 Chester Road (east)	1188	81	1439	149	1504	356
Coleshill Heath Road (south)	423	131	328	122	368	199
A452 Chester Road (west)	708	0	872	74	1002	151

8.4.107 Table 8-73 and Table 8-74 show that in the AM peak hour queues presently form on the Coleshill Heath Road north. By 2026, queues also develop in the A452 Chester Road west approach to the junction and by 2041 there are queues on both the Coleshill Heath Road (north) and A452 Chester Road west. This is likely to be as a result of traffic from the north west seeking to access the business parks, the airport and NEC in the area as well as to access the strategic network.

8.4.108 Typically queues are not as substantial in the PM peak hour and are generally contained without blocking any major upstream junctions.

8.4.109 Table 8-75 considers the operation of A452 Chester Road/Coleshill Heath Road roundabout junction in terms of average journey times/delays and junction throughput the weekday AM peak hour.

Table 8-75: A452 Chester Road/Coleshill Heath Road AM peak hour average journey times (seconds) and throughput - 2012, 2026, 2041 future baseline (no Proposed Scheme)

A452 Chester Road/Coleshill Heath Road	**AM peak (08:00-09:00)**		
	2012	**2026**	**2041**
junction throughput (vehicles)	2629	3085	3113
Average travel time per vehicle (seconds)	42	63	145

8.4.110 Table 8-76 below shows the operation of the A452 Chester Road/Coleshill Heath Road roundabout junction in terms of average journey times/delays and junction throughput the weekday PM peak hour.

Table 8-76: A452 Chester Road/Coleshill Heath Road PM peak hour average journey times (seconds) and throughput - 2012, 2026, 2041 future baseline (no Proposed Scheme)

A452 Chester Road/Coleshill Heath Road	PM peak (17:00-18:00)		
	2012	2026	2041
junction throughput (vehicles)	2979	3425	3652
Average travel time per vehicle (seconds)	33	39	49

8.4.111 Table 8-75 and Table 8-76 above shows that average journey times through the junction are forecast to increase by around 50% by 2026 and a further 130% by 2041 in the AM peak hour and by around 18% by 2026 and a further 26% by 2041 in the PM peak hour. The junction throughput is expected to increase by around 17% by 2026 and a further 1% by 2041 in the AM peak hour and by around 15% by 2026 and a further 6% by 2041 in the PM peak hour.

Junction performance summary

8.4.112 The analysis of the key junctions above shows that queues and delays are forecast to develop around the network as a result in increased junction throughputs. The queues, particularly at M42 junction 6 are expected to create blocking on to the mainline of the motorway and as a consequence affect the flow and operation of the mainline. This is reflected in the increased network delays and reduced vehicle speeds which were seen in the network performance statistics and the increased demand from the M42 south and M42 north that is unable to enter the network.

Route travel times

M42 junction 6-J7

8.4.113 Table 8-77 summarises the change in journey times on the M42 in the weekday AM peak hour for 2012, 2026 and 2041. Results have been extracted from the validated and future years VISSIM models.

Table 8-77: M42 travel time AM peak hour (seconds) - 2012, 2026, 2041 future baseline (no Proposed Scheme)

AM peak (08:00-09:00)	2012	2026	2041
northbound	166	299	319
southbound	173	321	327

8.4.114 Table 8-78 below summarises the change in journey times on the M42 in the weekday PM peak hour for 2012, 2026 and 2041. Results have been extracted from the validated and future years VISSIM models.

Table 8-78: M42 travel time PM peak hour (seconds) - 2012, 2026, 2041 future baseline (no Proposed Scheme)

PM peak (17:00-18:00)	2012	2026	2041
northbound	174	353	426
southbound	173	311	346

8.4.115 Table 8-77 and Table 8-78 show that average travel times in the AM peak over this section of the network are expected to increase by 81% northbound and 85% southbound by 2026 and a further 7% northbound and 2% southbound by 2041.

8.4.116 Table 8-77 and Table 8-78 show that average travel times in the PM peak over this section of the network are expected to increase by 103% northbound and 79% southbound by 2026 and a further 21% northbound and 11% southbound by 2041.

A45 Coventry Road between Goodway Road and Shepherds Lane

8.4.117 Table 8-79 summarises the change in journey times on the A45 Coventry Road in the weekday AM peak hour for 2012, 2026 and 2041. Results have been extracted from the validated and future years VISSIM models.

Table 8-79: A45 Coventry Road travel time AM peak hour (seconds) - 2012, 2026, 2041 future baseline (no Proposed Scheme)

AM peak (08:00-09:00)	**2012**	**2026**	**2041**
eastbound	335	483	486
westbound	335	371	379

8.4.118 Table 8-80 summarises the change in journey times on the A45 Coventry Road in the weekday PM peak hour for 2012, 2026 and 2041. Results have been extracted from the validated and future years VISSIM models.

Table 8-80: A45 Coventry Road travel time PM peak hour (seconds) - 2012, 2026, 2041 future baseline (no Proposed Scheme)

PM peak (17:00-18:00)	**2012**	**2026**	**2041**
eastbound	330	357	421
westbound	341	407	465

8.4.119 Table 8-79 and Table 8-80 show that average travel times in the AM peak over this section of the network are expected to increase by 44% eastbound and 11% westbound by 2026 and a further 1% eastbound and 2% westbound by 2041.

8.4.120 Table 8-79 and Table 8-80 show that average travel times in the PM peak over this section of the network are expected to increase by 8% eastbound and 19% westbound by 2026 and a further 18% eastbound and 14% westbound by 2041.

A446 between Stonebridge Island and A446 Stonebridge Road/B4117 Coventry Road junction

8.4.121 Table 8-81 summarises the change in journey times on the A446 in the weekday AM peak hour for 2012, 2026 and 2041. Results have been extracted from the validated and future years VISSIM models.

Table 8-81: A446 Coventry Road travel time AM peak hour (seconds) - 2012, 2026, 2041 future baseline (no Proposed Scheme)

AM peak (08:00-09:00)	2012	2026	2041
northbound	238	225	228
southbound	256	459	552

8.4.122 Table 8-82 summarises the change in journey times on the A446 in the weekday PM peak hour for 2012, 2026 and 2041. Results have been extracted from the validated and future years VISSIM models.

Table 8-82: A446 travel time PM peak hour (seconds) - 2012, 2026, 2041 future baseline (no Proposed Scheme)

PM peak (17:00-18:00)	2012	2026	2041
northbound	228	227	234
southbound	247	247	271

8.4.123 Table 8-81 and Table 8-82 how that average travel times in the AM peak over this section of the network are relatively stable in the northbound direction but increased in the southbound direction by 79% by 2026 and a further 20% by 2041.

8.4.124 Table 8-81 and Table 8-82 show that average travel times in the PM peak over this section of the network are relatively stable in both 2026 and 2041.

A452 between Cornet's End roundabout and A452 Chester Road/Coleshill Heath Road roundabout

8.4.125 Table 8-85 summarises the change in journey times on the A452 in the weekday AM peak hour for 2012, 2026 and 2041. Results have been extracted from the validated and future years VISSIM models.

Table 8-83: A452 travel time AM peak hour (seconds) - 2012, 2026, 2041 future baseline (no Proposed Scheme)

AM peak (08:00-09:00)	2012	2026	2041
northbound	299	325	332
southbound	331	348	359

8.4.126 Table 8-84 summarises the change in journey times on the A452 in the weekday PM peak hour for 2012, 2026 and 2041. Results have been extracted from the validated and future years VISSIM models.

Table 8-84: A452 travel time PM peak hour (seconds) – 2012, 2026, 2041 future baseline (no Proposed Scheme)

PM peak (17:00-18:00)	2012	2026	2041
northbound	293	304	318
southbound	325	380	483

8.4.127 Table 8-83 and Table 8-84 show that average travel times in the AM peak over this section of the network are expected to increase by 8% northbound and 5% southbound by 2026 and a further 2% northbound and 3% southbound by 2041.

8.4.128 Table 8-83 and Table 8-84 show that average travel times in the PM peak over this section of the network are expected to increase by 4% northbound and 17% southbound by 2026 and a further 4% northbound and 30% southbound by 2041.

Accidents and safety

8.4.129 A full network safety analysis has been undertaken for 2012 in the baseline assessment within this report. There are no safety analyses or assessments for the future baseline, or issues identified for the future baseline network operation as a result of changes to the highway network or travel demands, and, therefore, the accident and safety records for the future baseline assessment are assumed to be the same as those for the baseline assessment.

Parking

8.4.130 There is limited on-street car parking provision and demand in the area. Parking is principally associated with the major land uses and changes in parking provision in the area are generally associated with planning permissions which are being/are to be implemented. The principally changes are at Birmingham Airport where the construction of the Runway Extension will see a loss of car parking spaces at the Passenger Terminal Site of some 2,300 spaces. The airport has permission to re-provide up to some 2,000 of these spaces on the Elmdon Terminal Site. The Birmingham Airport Master Plan 2007, has a plan period to 2030, but there are no other committed schemes for additional car parking at Birmingham Airport included in the future baseline assessment.

8.4.131 Additionally, the Resortsworld Birmingham leisure complex at the NEC will include some 470 integral car parking spaces within the envelope of the built development. This will increase the overall car parking provision at the NEC, but only by some 370 spaces, as some existing surface level car parking spaces will be lost as a result of the Resortsworld Birmingham development.

8.4.132 Other than local amendments associated with the on-going Regenerating north Solihull scheme, there are no major committed changes in car parks or parking restrictions and, therefore, the car parks and parking restrictions in Chelmsley Wood in the future baseline assessment are assumed to be the same as those in the baseline assessment.

Rail

8.4.133 The Network Rail Strategic Business Plan for England & Wales sets out how the rail industry expects demand for rail to grow and be met over a five-year business plan period CP5 (Control Period 5 - 2014-2019). The plan is in response to Government's High Level Output Specification (HLOS) which set out future strategic rail projections. The HLOS forecasts are summarised in Table 8-85 below.

Table 8-85: HLOS projects for CP5

	Peak three hours		High peak hour	
HLOS	**Forecast demand in 2013/14**	**Extra demand to be met by 2018/19**	**Forecast demand in 2013/14**	**Extra demand to be met by 2018/19**
London	539,300	119,000	268,500	54,200
Birmingham	37,500	3,900	19,200	1,800
Leeds	25,400	5,100	13,000	2,800
Manchester	28,100	6,200	13,600	2,600
Others	34,800	4,900	16,500	2,000

8.4.134 Table 8-85 shows that the government's forecast is for a continued growth in peak hour travel demands on the strategic rail network with demand into and out of Birmingham forecast to grow by a further 10.4% (peak three hours) over CP5.

8.4.135 The key railway station in the Birmingham Interchange and Chelmsley Wood area is Birmingham International station. It is one of the principal rail stations on the west Coast Main Line and provides access to national and local rail services.

8.4.136 There is limited scope for additional services at Birmingham International Station, with any increase in capacity likely to be achieved by operating longer trains, rather than more frequent services. There are no committed changes to the strategic and long distance trains serving Birmingham International Station, with destinations and frequencies for the future baseline assessment assumed to be the same as those in the baseline assessment. Table 8-86 summarises the future baseline demand for long distance trips from the PLANET modelling compared with the baseline demand.

Table 8-86: PLANET forecast of long distance boarders and alighters at Birmingham International station 16-hour - 2012, 2026, 2041 future baseline (no Proposed Scheme)

Year	**Boarders**	**Alighters**
2012*	2,922	2,786
2026	5,139	5,047
2041**	6765	6581

* interpolated from the 2010 and 2026 PLANET model forecasts
** extrapolated from the 2010, 2026 and 2036 PLANET model forecasts

8.4.137 Table 8-86 shows that, compared to 2012, long distance boarder and alighter demands are forecast to increase by 76% and 81% respectively by 2026 and a further 32% and 30% respectively by 2041.

8.4.138 In terms of access mode share, there are a number of proposals such as extensions to the Midland Metro light rail system and improvements to accessibility through the M42 Economic Gateway which could influence future mode share. However, neither of these schemes at this stage has committed funding and therefore it is assumed that the existing mode share continues into the future. This is considered to be a robust position in that any improvements to sustainable access will reduce the number of private vehicle trips on the network.

8.4.139 No additional data on growth in demand on local services for Birmingham International station stations is available (i.e. beyond that for the baseline assessment) and, therefore, with no committed changes in local services for the future baseline assessment, they are assumed to be the same as those in the baseline assessment and based around Birmingham International station.

Local bus and coach services

8.4.140 The A45 Transport Corridor improvements include measures to improve public transport accessibility along the A45 Coventry Road corridor from Birmingham to Birmingham International Station and Birmingham Airport. The scheme, which is presently being implemented, will include a dedicated public transport corridor which will be able to facilitate bus or LRT.

8.4.141 There are no committed changes to the bus services and it is assumed that bus services will develop in line with commercial demand, public transport mode share targets for Birmingham Airport, the NEC and Birmingham Business Park and planning approvals with any further development at the Airport, NEC and Birmingham Business Park. Otherwise, there are no committed changes in the bus services included in the future baseline assessment.

8.4.142 Centro has aspirations to improve accessibility to the area and sees the development of the Proposed Scheme as well as other schemes such as the M42 Economic Gateway playing a major role in delivering opportunities for doing so.

8.4.143 Coach services in the Birmingham Interchange and Chelmsley Wood area are concentrated about Birmingham Airport. There are no committed changes to the coach services that connect with Birmingham Airport, where it is assumed that coach services will develop in line with commercial demand, public transport mode share targets for Birmingham Airport and planning approvals with any further development at the Airport. Otherwise, there are no committed changes in the coach services included in the future baseline assessment.

Public transport interchanges

8.4.144 Birmingham International Station provides a multi-modal interchange for Birmingham Airport, the NEC and local offices, businesses and commercial premises. The interchange is located on the west Coast Main Line between the Airport, which is accessible via the Air-Rail Link, and the NEC, which is accessible via a dedicated, enclosed pedestrian link over the west Coast Main Line.

8.4.145 Following the completion of Solihull MBC's ANITA (Airport and NEC Integrated Transport Access) scheme, there are no committed changes to the public transport and multi modal interchange facilities at Birmingham International Station and, therefore, the public transport interchange facilities in the future baseline assessment are assumed to be the same as those in the baseline assessment.

Taxis

8.4.146 There are no committed changes in the arrangements or facilities for taxis in the Birmingham Interchange and Chelmsley Wood area and, therefore, the taxi arrangements and facilities in the future baseline assessment are assumed to be the same as those in the baseline assessment.

Pedestrians, cyclists and equestrians

8.4.147 Dedicated pedestrian and cycle facilities in the Middle Bickenhill area are limited due to the rural nature of the area and the surrounding strategic road network. In the area around Birmingham Airport, Birmingham International Station and the NEC, pedestrian and cycle facilities are provided to facilitate access to the transport hubs, the NEC and local offices, businesses and commercial premises. Chelmsley Wood is well served by pedestrian and cycle facilities, as is typical of an urban area.

8.4.148 Solihull MBC cycle strategy seeks to "promote and increase cycle use throughout Solihull, by highlighting the benefits of cycling as a healthy sustainable mode of transport and through the development of green infrastructure which is safe, convenient, efficient and attractive for cyclists."

8.4.149 Solihull MBC walking strategy seeks to "promote and increase the role of walking as a mode of transport when making local journeys and as a recreational leisure activity."

8.4.150 Solihull MBC are presently implementing a series of improvements to cycle links around the north Solihull area including in residential areas of Winward Way, Green Lane, Moorend Avenue, Lanchester Way/Auckland Drive/Windleaves Road and Chelmsley Road/Lanchester Way.

8.4.151 The realignment of the A45, with the Runway Extension at Birmingham Airport, includes a new dedicated cycleway (and footway) on it southern side between Bickenhill and Elmdon, otherwise there are no other committed changes in the cycle facilities in the future baseline assessment. The Runway Extension proposals also include the local realignment of a Bridleway in Bickenhill.

Waterways and canals

8.4.152 There are no navigable waterways or canals in the Birmingham Interchange and Chelmsley Wood area.

Air transport

8.4.153 Birmingham Airport is located to the west of the M42 and west Coast Main Line. Based on the 2012 passenger throughput, it is the seventh biggest airport in the UK and the second busiest regional airport in the England, with an annual passenger throughput of 8.92 million passengers in 2012 (and 8.67 million passengers in 2011).

8.4.154 The main highway access route to the Passenger Terminal Site is via junction 6 of the M42, the A45 and dedicated inbound/outbound access roads, with access also available via the A45, Clock Island, Bickenhill Lane and Airport Way. On site infrastructure includes an internal road system for traffic to circulate into and out of the Passenger Terminal Site, pick-up/drop-off areas, bus stops for local bus services and for National Express and Megabus coach services, taxi pick-up areas, and short, medium, long term and staff car parking. The Airport has some 13,000 car parking spaces, including some 1,600 spaces for staff.

8.4.155 The Runway Extension at Birmingham Airport is due to be completed and opened for operations in 2014. As part of the A45 Transport Corridor Improvement scheme, and to facilitate the Runway Extension, the A45 has been realigned, to include a dedicated public transport corridor between the Elmdon Terminal Site and the Passenger Terminal Site, bypassing the A45 Coventry Road, with dedicated provision for the Midland Metro to be included later. The realigned A45 was opened to traffic in 2013. In addition, there are also improvements at junction 6 of the M42 with the Runway Extension.

8.4.156 The planning approval for the Runway Extension includes planning obligations on the Airport to improve its public transport surface access mode share to 31% by the end of 2022 or an annual passenger throughput of 20.9 million passengers (with an intermediary target of 25% by the end of 2012, and a further target of 37% by the end of 2030 or an annual passenger throughput of 27.2 million passengers).

Future baseline summary

8.4.157 Table 8-87 provides a summary of the issues by mode in the Birmingham Interchange and Chelmsley Wood area.

Table 8-87: Future baseline; summary of issues

Mode	Issue	
	2026	2041
Highway	Highway network approaching capacity including links (A452 Chester Road between Birmingham Business Park and Coleshill Heath Road) and junctions (M42 junction 6 with queuing at junction on a number of approaches). No major issues identified on the local network although A452 Chester Road/Coleshill Heath Roundabout has queues developing.	Highway network approaching capacity with links including: - M42 north of junction 6 (SB) - M42 south of junction 6 (NB) - A452 Chester Road (between Birmingham Business Park and Coleshill Heath Road) - M42 north of M6 link road (SB) - A446 Stonebridge Road north of A452 slips (SB) - A45 Coventry Road between Damson Parkway and Clock junction (WB) A number of junctions are also seen to have increasing queues and delays including: - M42 junction 6 with queuing at junction back to the M42 mainline - Stonebridge Island with queuing on the A45 off slips and A452 Chester Road - A45 Coventry Road/Damson Parkway junction - A452 Chester Road/Bickenhill Parkway; queues on Solihull Parkway and A452 approaches - A452 Chester Road/Coleshill Heath Roundabout; queues on the Chester road and Coleshill Heath Road approaches.
Public Transport	No issue	No issue
Pedestrian, Cyclists and Equestrians	No issue	No issue
Waterways	No issue	No issue
Parking	No issue	No issue
Air Transport	No issue	No issue

Birmingham interchange and Chelmsley Wood (CFA24) Proposed Scheme construction description

8.4.158 This section provides an overview of the construction traffic and transport impacts for the section of Proposed Scheme that will pass through the Birmingham Interchange and Chelmsley Wood area. This area includes construction of the Birmingham Interchange Station.

8.4.159 The construction period for the whole route is programmed for 2017 - 2026. The base year for assessment of construction impacts has been chosen at 2021. The forecast peak construction activities have then been overlaid on 2021, with, as relevant, overlapping activities (in both area of importance and timing) considered in combination.

8.4.160 The following sections consider the construction activities and impacts in greater detail.

Construction activities

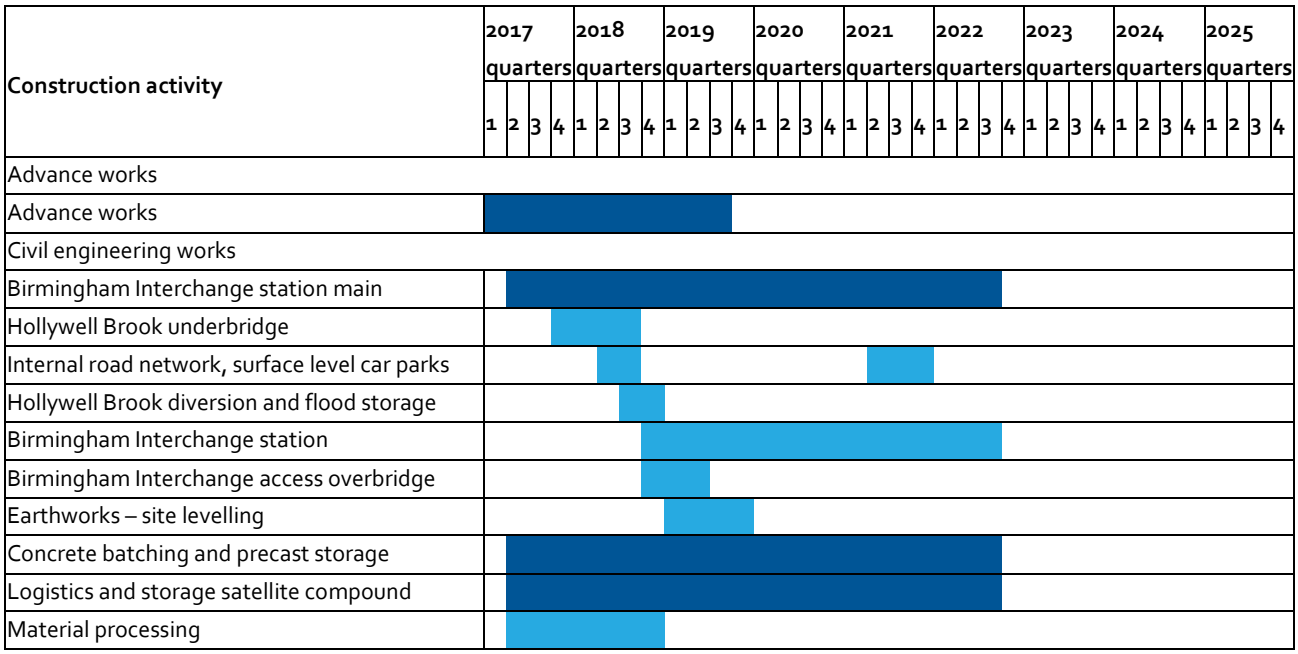
8.4.161 The construction assessment considers the traffic and transport impacts in three peak months of construction activity, based on the proposed phasing of the works. The peak months have been identified as months 22 (2018 Quarter 4), 27 (2019 Quarter 1) and 36 (2019 Quarter 4), which are each assessed. In months 22 and 27 there will be 10 operational worksites, and in month 36 there will be 12 worksites that would be in operation. The construction assessment considers average construction traffic levels for the peak months and outside of these peaks activity is expected to be lower for much of the time. The construction assessments have also considered any impacts that arise from construction in the adjoining areas.

8.4.162 The major construction elements within the Birmingham Interchange and Chelmsley Wood area have been discussed above but are summarised below along with the expected programme.

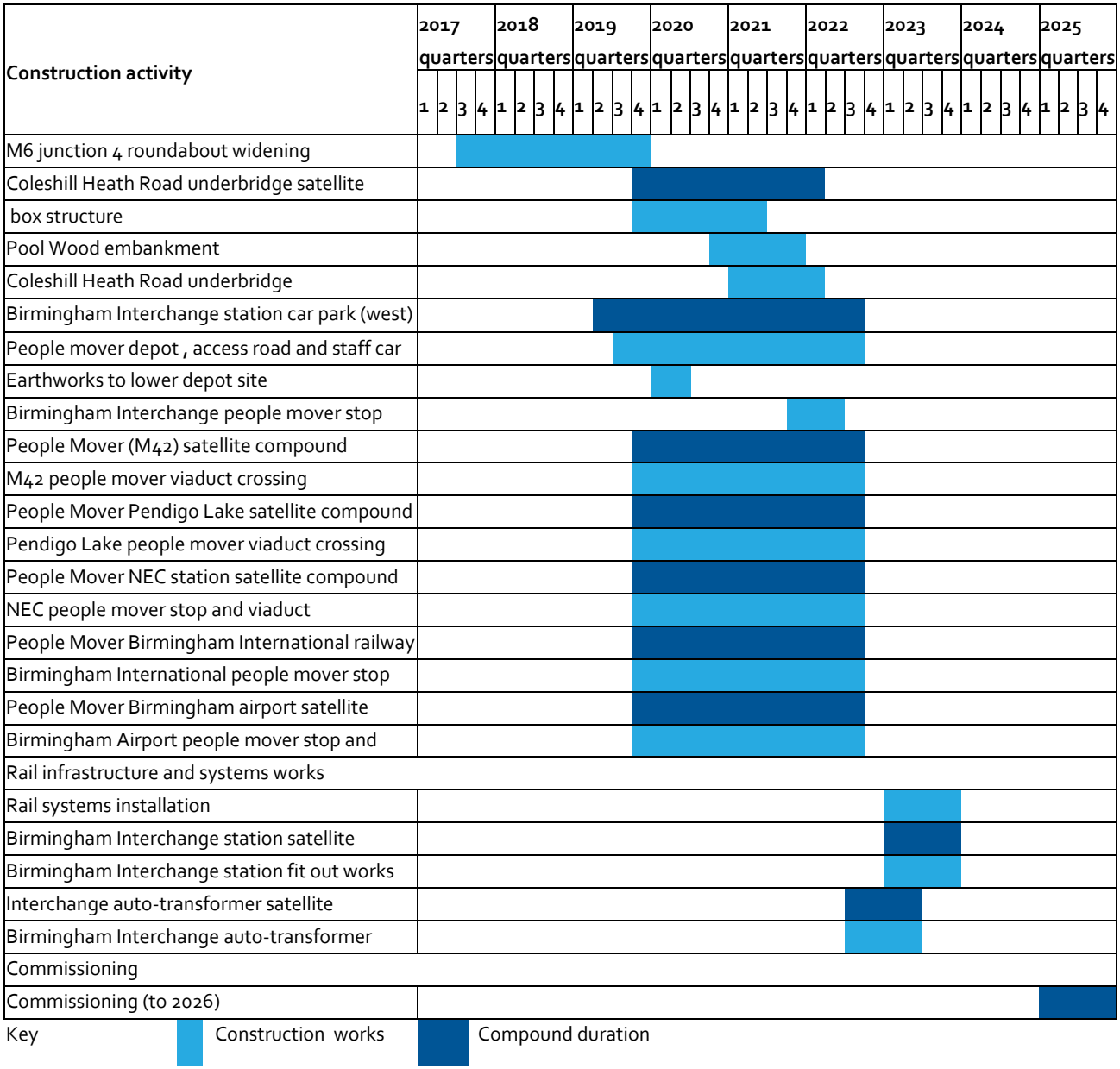
Compounds and construction sites

8.4.163 Details of the construction phasing are provided above and the main construction works and the time periods when each compound is operational are summarised in Figure 8-7.

Figure 8-7: Birmingham Interchange and Chelsmley Wood (CFA26) construction activity phasing



Construction activity	2017 quarters				2018 quarters				2019 quarters				2020 quarters				2021 quarters				2022 quarters				2023 quarters				2024 quarters				2025 quarters			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Logistics and storage																																				
Birmingham Interchange temporary workers																																				
Birmingham Interchange temporary workers																																				
A45 (Stonebridge Island) satellite compound																																				
A45 Coventry Road/A452 Chester Road																																				
A45/A45 Service Road overbridges satellite																																				
National Motorcycle Museum access																																				
Pasture Farm accommodation overbridge (in																																				
Diversion of unnamed watercourse																																				
Diddington cutting																																				
A45 Service Road overbridge																																				
A45 Coventry Road overbridge and earthworks																																				
Bickenhill Waste Recycling Centre access																																				
east Way underbridge loop satellite compound																																				
east Way loop underbridge																																				
A45/east Way overbridges satellite compound																																				
east Way overbridge																																				
A45/M42 junction 6 roundabout satellite																																				
A45 /M42 junction 6 widening and segregated																																				
A45/M42 retaining walls																																				
A45/M42 earthworks																																				
Birmingham Interchange station car park (east)																																				
A452 Chester Road widening and																																				
A452 Chester Road earthworks																																				
Toby Carvery public house access																																				
A452/A446 roundabout satellite compound																																				
Bickenhill culvert																																				
Bickenhill cutting																																				
A452/A446 roundabout works north overbridge																																				
Packington culvert																																				
A452/A446 roundabout works south overbridge																																				
Auto-transformer station base slab and																																				
A452 southbound on and northbound off links																																				
A446 Stonebridge Road widening																																				
A446 southbound off and northbound on links																																				
Bickenhill embankment																																				
M42 viaduct (east) satellite compound																																				
A452 link road overbridge																																				
A452 Link Road demolition																																				
A452 link road																																				
A452 Chester Road roundabout removal																																				
Packington embankment																																				
M42 viaduct (west) satellite compound																																				
A452/B4438 roundabout works, B4438 Bickenhill Parkway Link and Solihull Parkway																																				
M42 viaduct																																				
M6 junction 4 satellite compound																																				



8.4.164 The location of the construction compounds and construction lorry routes are shown on Map CT-05-105b to Map CT-05-107-R1 (Volume 2, Map Book 24).

8.4.165 Table 8-88 summarises the anticipated average and peak workforce to be required at each construction compound.

Table 8-88: Assumed workforce at construction sites

Compound type	Location	Assumed daily workforce per site for duration with busy vehicle movements	
		Average	Peak
Satellite	A45/A452 (Stonebridge Island) satellite compound	40	55

Compound type	Location	Assumed daily workforce per site for duration with busy vehicle movements	
		Average	Peak
Satellite	A45/A45 Service Road overbridges satellite compound	60	80
Satellite	east Way underbridge loop satellite compound	8	11
Satellite	A45/east Way overbridges satellite compound	8	11
Satellite	A45/M42 junction 6 roundabout satellite compound	16	22
Satellite	Birmingham Interchange station temporary workers accommodation satellite compound	0	0
Satellite	Birmingham Interchange car park (east) satellite compound	16	22
Satellite	People Mover Pendigo Lake satellite compound	16	22
Satellite	People Mover M42 crossing satellite compound	16	22
Satellite	Birmingham Interchange car park (west) & people mover depot satellite compound	16	22
Main	Birmingham Interchange station main compound	260	360
Satellite	People Mover Birmingham International station satellite compound	16	22
Satellite	People Mover NEC station satellite compound	16	22
Satellite	People Mover Birmingham airport station satellite compound	16	22
Satellite	A452/A446 roundabout satellite compound	16	22
Satellite	M42 viaduct (east) satellite compound	16	22
Satellite	M42 viaduct (west) satellite compound	16	22
Satellite	M6 junction 4 satellite compound	16	22

8.4.166 The construction compounds will also be the main location for advance works including utilities. It should be noted that the activity associated with the advance works (including utilities) and rail installation works, which will follow on after the civils work, will be of a lower intensity and will generate a lower level of HGV activity.

8.4.167 Typical vehicle trip generation for construction site compounds in this area are shown in Table 8-89 below. The duration of when there will be busy transport activity at each site is also shown in the table below. This represents the periods when the construction traffic flows will be greater than 50% of the peak month flows. The estimated number of daily vehicle trips during the operation of each compound is shown, the lower end of the range shows the average number of trips in the busy period and the upper end shows the peak month flows. The assessment scenario has assumed the peak month for the combination of activities, i.e. not necessarily the peak activity at each individual site.

Table 8-89:Typical vehicle trip generation for construction site compounds in this area

Compound type	Location	Access	Indicative start/set up date	Estimated duration of use (years)	Estimated duration with busy vehicle movements (months)	Average daily combined two-way vehicle trips during busy period and during peak month of activity	
						Cars/ LGV	HGV
Satellite compound	A45 (Stonebridge Island) satellite compound	A45 Coventry Road westbound off-slip approach to Stonebridge Island	Q2 2017	1	9	10-15	15-15
Satellite compound	A45/A45 Service Road overbridges satellite compound	A45 Coventry Road westbound service road, between Stonebridge Island and Bickenhill Waste Reception Centre entrance	Q2 2017	4.5	3	15-20	220-220
Satellite compound	east Way underbridge Loop satellite compound	A45 Coventry Road westbound service road, between Bickenhill Waste Recycling Centre and east Way Loop	Q2 2017	4.5	2	10-15	30-30
Satellite compound	A45/east Way overbridges satellite compound	A45 Coventry Road eastbound service road, between east Way Loop and Stonebridge Island	Q2 2017	4.5	4	10-15	30-30
Satellite compound	A45/M42 junction 6 roundabout satellite compound	Off northbound M42	Q2 2017	1.5	9	30-45	15-20

Compound type	Location	Access	Indicative start/set up date	Estimated duration of use (years)	Estimated duration with busy vehicle movements (months)	Average daily combined two-way vehicle trips during busy period and during peak month of activity	
						Cars/ LGV	HGV
Satellite compound	Birmingham Interchange car park (east) satellite compound	A45 Coventry Road eastbound service road, opposite east Way Loop	Q2 2017	2.5	8	45-65	30-30
Satellite compound	People mover Pendigo Lake satellite compound	Southway between Pendigo Way and M42 junction 6	Q4 2019	3	2	25-35	<10-<10
Satellite compound	People mover M42 crossing satellite compound	east Way between Pendigo Way and M42 southbound slip road loop	Q4 2019	3	2	25-35	<10-<10
Satellite compound	Birmingham Interchange car park (west) satellite compound and people mover depot compound	A45 Coventry Road eastbound service road, opposite east Way Loop	Q4 2019	3	2	25-35	<10-<10
Main compound	Birmingham Interchange station main compound	A45 Coventry Road eastbound service road, between east Way Loop and Stonebridge Island	Q2 2017	5.5	15	140-190	20-30
Satellite compound	People mover Birmingham International station satellite compound	Bickenhill Lane, off at roundabout with Station Link Road via car park entrance	Q4 2019	3	3	30-45	<10-<10
Satellite compound	People mover NEC station satellite compound	Perimeter Road	Q4 2019	3	1	30-45	<10-<10
Satellite compound	People mover Birmingham Airport station satellite	Hermes Road	Q4 2019	3	1	25-35	<10-<10

Compound type	Location	Access	Indicative start/set up date	Estimated duration of use (years)	Estimated duration with busy vehicle movements (months)	Average daily combined two-way vehicle trips during busy period and during peak month of activity	
						Cars/ LGV	HGV
	compound						
Satellite compound	A452/A446 roundabout satellite compound	A452 Chester Road northbound, north of diverge from A446 Stonebridge Road	Q1 2017	2	13	25-35	200-220
Satellite compound	M42 viaduct (east) satellite compound	A452 Chester Road northbound, between Melbicks Garden & Leisure centre entrance and A452/ A446 roundabout	Q3 2017	4.5	5	15-25	175-190
Satellite compound	M42 viaduct (west) satellite compound	B4438 Bickenhill Parkway between A452 Chester Road/A446 Stonebridge Road roundabout and Northway roundabout	Q3 2017	4.5	12	10-15	25-30
Satellite compound	M6 junction 4 satellite compound	Access off M6 junction 4 roundabout	Q3 2017	2.5	2	30-40	30-30
Satellite compound	Coleshill Heath Road underbridge satellite compound	Yorkminster Drive	Q1 2021	2.5	10	15-25	30-35

8.4.168 The construction assessment has considered the traffic and transport impacts in three peak months of construction activity, based on the proposed phasing of the works. The peak months have been identified as Months 22 (2018 Quarter 4), 27 (2019 Quarter 1) and 36 (2019 Quarter 4), which are each assessed. In Months 22 and 27 there will be 10 operational worksites, and in Month 36 there will be 12 worksites that would be in operation. The construction assessment considers average construction traffic levels for the peak months and outside of these peaks activity is expected to be lower for much of the time. In general the impacts are greatest in Month 27 however in considering the impacts of the Proposed Scheme within this area, the Transport Assessment reports the worst case impact irrespective of whichever of the three months the impact is identified. Where impacts occur in particular peak periods these are identified below. Where impacts relate to specific activities these are also identified.

8.4.169 The construction assessments have also considered any impacts that arise from construction in the adjoining areas by ensure construction related traffic from these areas is included within the assessment.

Construction lorry routes

8.4.170 The construction lorry routes that will be used the access the above compounds are shown on Maps TR-03-154 to TR-03-155a, (Volume 5, Map Book 71).

8.4.171 The proposed lorry route for the Birmingham interchange station construction site compound would be northwards along Middle Bickenhill Lane continuing southwards along the A452 Chester Road to Stonebridge Island and then westwards along the A45 Coventry Road to M42 junction 6.

8.4.172 Satellite construction site compounds would generally be more remote and operational for shorter durations. Lorry routes would be either via internal site access routes or A, B or minor unclassified standard roads including:

- The proposed lorry route for the Stonebridge Island construction site compound would be westwards along the A45 Coventry Road to junction 6 of the M42;
- The proposed lorry route for the A45 overbridges construction site compound would be southwards along the site access to Diddington Lane and then northwards along Diddington Lane to Stonebridge Island via the A452 Chester Road. From Stonebridge Island the route would proceed westwards along the A45 Coventry Road to junction 6 of the M42. Within three months of this site compound being established an access direct to the A45 Service Road would be provided;
- The proposed lorry route for the A45 overbridge/east Way Loop bridge construction site compound would be westwards along the A45 Service Road and continuing on the A45 Coventry Road to junction 6 of the M42;
- The proposed lorry route for the A45 east Way overbridges loop construction

site compound would be eastwards along the A45 Coventry Road to Stonebridge Island and continuing westwards along the A45 Coventry Road to junction 6 of the M42;

- The proposed lorry route for the M42 viaduct construction site compound would be northwards or southwards from junction 6 of the M42;
- The proposed lorry route for Birmingham Interchange station car park (east) construction site compound would be southwards along the A452 Chester Road to Stonebridge Island and then westwards along the A45 Coventry Road to junction 6 of the M42;
- The proposed lorry route for the automated people mover Pendigo Lake construction site compound would be westwards along east Way, continuing southwards to Pendigo Way and westwards to junction 6 of the M42;
- The proposed lorry route for the automated people mover M42 crossing construction site compound would be westwards along east Way, continuing southwards to Pendigo Way and westwards to junction 6 of the M42;
- The proposed lorry route for the Birmingham Interchange station car park (west) and automated people mover depot construction site compound would be northwards along Middle Bickenhill Lane continuing southwards along the A452 Chester Road to Stonebridge Island and then westwards along the A45 Coventry Road to junction 6 of the M42;
- The proposed lorry route for the automated people mover Birmingham International railway station construction site compound would be southwards through the railway station car park along Bickenhill Lane to the A45 Coventry Road roundabout and then eastwards to junction 6 of the M42;
- The proposed lorry route for the automated people mover NEC station construction site compound would be southwards along the perimeter road, continuing eastwards along south Car Park Road and Pendigo Way and then westwards to junction 6 of the M42;
- The proposed lorry route for the automated people mover Birmingham Airport construction site compound would be southwards along Airport Way, continuing eastwards and southwards along Bickenhill Lane to the A45 Coventry Road roundabout and then eastwards to junction 6 of the M42;
- The proposed lorry route for the A446 Stonebridge Road/A452 Chester Road roundabout construction site compound would be southwards along the A452 Chester Road to Stonebridge Island and then westwards along the A45 Coventry Road to junction 6 of the M42;
- The proposed lorry route for the M42 Viaduct (east) construction site compound would be southwards along the A452 Chester Road to Stonebridge Island and then westwards along the A45 Coventry Road to junction 6 of the M42;
- The proposed lorry route for the M42 viaduct (west) construction site

compound would be directly off the north bound lane of the M42 with appropriate traffic management in place. An alternative route would be northwards along Bickenhill Parkway and then southwards along the A452 Chester Road to Stonebridge Island and then westwards along the A45 Coventry Road to junction 6 of the M42;

- The proposed lorry route for the M6 junction 4 construction site compound would be eastwards or westwards along the M6; and
- The proposed lorry route to the M6 No.1 viaduct satellite office is Yorkminster Drive/Coleshill Heath Road, continuing onto A446 Stonebridge Road and M6.

8.4.173 In addition to lorry routes into the area, there will also need to be lorry movements through the areas associated with construction in the adjoining areas. These construction routes can be summarised as follows:

- from M42 junction 6 eastbound on the A45 Coventry Road to Stonebridge Island, A452 Chester Road northbound, A446 Stonebridge Road and straight over M6 junction 4 to A446 Stonebridge Road for movements to/from Coleshill junction area;
- from M42 junction 6 eastbound on the A45 Coventry Road to Stonebridge Island, A452 Kenilworth Road southbound for movements to/from Balsall Common & Hampton in Arden area; and
- from A45 Coventry Road east to Stonebridge Island, A452 Chester Road northbound, A446 Stonebridge Road and straight over M6 junction 4 to A446 Stonebridge Road for movements to/from Coleshill junction area.

8.4.174 A new haul route (temporary) will also be provided which will seek to reduce the need to move materials and waste via the public highway network. Details of the temporary haul routes to be created are provided in Table 8-90 below.

Table 8-90: New haul routes (temporary) for CFA24

Description of route including access from public highway	Compounds served by haul route
Access to the A45/A45 Service Road overbridges satellite sites is from a temporary access route from CFA23 from Shadow Brook viaduct satellite site compound. Access would be along the haul route to the west of the Proposed Scheme, passing to the east of Pasture Farm and then continuing to the south of the A45 running adjacent to the Proposed Scheme on the eastern side.	A45/A45 Service Road overbridges satellite compound Coventry Road
Access to the Stonebridge Island roundabout satellite compound site would be from off the A45. To the east of the compound is a topsoil/temporary storage stockpile area.	Stonebridge Island satellite compound
Access off the A45 onto a temporary haul route aligned west of the satellite compound. The temporary haul route then continues north-west for the construction of Hollywell Brook underbridge and to the Birmingham Interchange car park (east) satellite site. The haul route is aligned to the south-west of the eastern car parks, the haul route then crosses the new internal interchange roads (dumbbell roundabout). The route then continues west of the Proposed Scheme to the facilitating the Birmingham interchange main compound and concrete batching precast storage compound. There are two areas of stockpiles to the east of the concrete batching precast storage	A45/east Way overbridges satellite compound. Birmingham Interchange car park (east) satellite site. Birmingham Interchange main compound. Concrete batching precast storage area. A446/A452 roundabout satellite compound.

Description of route including access from public highway	Compounds served by haul route
compound area. The temporary haul route continues west of the Proposed Scheme and then splits into two routes. One temporary route is aligned the southern part of the A452/A446 roundabout to facilitate the A446/A452 roundabout satellite compound. There is also a vehicle recovery compound area to the south east of this compound. The other temporary route continues west of the Proposed Scheme (aligned along the west part of the A446/A452 roundabout) and then connects to the M42 viaduct (east) satellite compound at approximate chainage 158+000 on the eastern side of the Proposed Scheme and the M42 viaduct (west) satellite compound on the western side of the Proposed Scheme. There are three areas of topsoil/temporary storage stockpile material in the vicinity of the M24 viaduct (west) satellite compound site.	M42 viaduct (east) satellite compound. M42 viaduct (west) satellite compound.
The temporary haul route would be accessed off the A45 and would then be aligned to the east of the Birmingham interchange car park (west) and people mover depot satellite compound.	Birmingham interchange car park (west) and people mover depot satellite compound (Middle Bickenhill Lane)
Access to the temporary workers accommodation and the logistics and storage area would be from the A45 and then along Middle Bickenhill Lane	Birmingham Interchange temporary works accommodation. Logistics and storage areas.
Access to the people mover M42 crossing satellite site compound would be from the A45 and then along east Way.	People mover Pendigo Lake satellite site compound.
Access to the people mover Pendigo Lake satellite site compound would be from the A45, then along east Way, Pendigo Way and south Way to the compound area.	People mover M42 crossing satellite compound
Access from the M42.	M42 junction 6 satellite compound
Access to the people mover NEC station satellite site compound would be from the A45, then along east Way, Pendigo Way, south Car Park Road, and Perimeter Road adjacent to the Rugby to Birmingham rail line.	People mover NEC station satellite compound
Access to the people mover International railway station satellite compound would be off the A45, then along Middle Bickenhill Lane and along an unofficial road adjacent to Portland House.	People mover International railway station satellite compound
Access to the people mover International Airport station satellite compound would off the A45, along Middle Bickenhill Lane, then along Airport Way.	People mover International Airport Station satellite compound.
The temporary access haul route to the M6 junction 4 satellite site compound would be from the A446 Stonebridge Road.	M6 junction 4 satellite site compound
Access via Coleshill Heath Road	Satellite site: Coleshill Heath Road /M6 Viaduct No. 1 satellite site compound

*Part of temporary haul route lies within CFA23 Balsall Common and Hampton-in-Arden.

Traffic management, road closures and diversions

8.4.175 The construction of the Proposed Scheme has been carefully planned to minimise disruption to travellers through any traffic management, road closures and diversions. Where closures are necessary, the general approach is the undertake closures for short discreet periods to ensure that the impact on users is minimised. Table 8-91 summarises the temporary closures that will be required.

Table 8-91: Road closures and diversions

Name	Location	Diversion route	Length of diversion	Duration	Comment
A45 Coventry Road	Ch155+950	Local to existing road	1000m	36 months	Phased construction of new bridges
A446 Stonebridge Road	Ch157+500	Existing carriageway	400m	24 months	Lane restrictions and also overnight & weekend lane closures
A446 Stonebridge Road	Ch158+500	Existing carriageway	1500m	18 months	Lane restrictions and also overnight & weekend lane closures
M42 junction 6 to 7	Ch156+200	Existing carriageway	500m	18 months	Construction of people mover viaduct. For piling and beam installation, formwork installation & removal potentially requiring lane restrictions and overnight/weekend lane closures
east Way/east Car Park Road/Pendigo Way	Ch156+200	Via A45 and B4438	4km	18 months	Potentially requiring lane restrictions and also 30 No overnight closures or 6 No weekend closures over construction period
Pendigo Way	Ch156+300	Via Perimeter Road	1.5km	18 months	Potentially requiring lane restrictions and also 30 No overnight closures or 6 No weekend closures over construction period
Perimeter Road (in front of NEC Main Entrance)	Ch156+300	Via Perimeter Road	1.5km	18 months	Potentially requiring lane restrictions and also 30 No overnight closures or 6 No weekend closures over construction period
Perimeter Road (adjacent to NR railway line)	Ch156+300	Via Perimeter Road	1.5km	18 months	Potentially requiring lane restrictions and also 30 No overnight closures or 6 No weekend closures over construction period
Station Link Road	Ch156+300	Via B4438	1km	18 months	Potentially requiring lane restrictions and also 30 No overnight closures or 6 No weekend closures over construction period
B4438	Ch156+300	Via Station Link Road	1km	18 months	Potentially requiring lane restrictions and also 30 No overnight closures or 6 No weekend closures over construction period

Name	Location	Diversion route	Length of diversion	Duration	Comment
Airport Way/Hermes Road Roundabout	Ch156+400	Via Airport Way, Hermes Road, Concorde Road or Vanguard Road	1km	18 months	Potentially requiring lane restrictions and also 30 No overnight closures or 6 No weekend closures over construction period
A452 Chester Road	Ch155+600	eastwards along A45 and on to B4436 to A452/A446 junction	7km	24 months	Potentially requiring lane restrictions and also 30 No overnight closures or 6 No weekend closures over construction period
A452 Chester Road	Ch158+250	Existing carriageway	1000m	18 months	Potentially requiring lane restrictions and also 30 No overnight closures or 6 No weekend closures over construction period
M42 junction 6 to 7	Ch158+300	Existing carriageway	500m	18 months	Construction of Proposed Scheme M42 viaduct. For piling and beam installation, formwork installation & removal potentially requiring lane restrictions and also 60 No overnight closures or 6 No weekend closures over construction period
Roundabout on A452/B4438	Ch158+400	Via B4438 and A452 during overnight closures	1km	18 months	Potentially requiring lane restrictions and also 30 No overnight closures or 6 No weekend closures over construction period
M42 junction 6	Ch156+200	Existing carriageway	500m	18 months	Potentially requiring lane restrictions and also 30 No overnight closures or 6 No weekend closures over construction period
M6 junction 4	Ch159+900	Existing carriageway	500m	18 months	Potentially requiring lane restrictions and also 30 No overnight closures or 6 No weekend closures over construction period
M6 junction 4	Ch159+900	Via M6 to junction 5	10km	18 months	For piling and beam installation, formwork installation & removal potentially requiring lane restrictions and also 30 No overnight closures or 6 No weekend closures over 3 month deck construction period

8.4.176 Generally closures and/or diversion are limited to short term interventions including overnight, off-peak or weekend periods. There are no planned longer term closures.

8.4.177 There will be temporary diversions of general traffic in place during overnight closures at a number of locations. Generally diversions are local to the diversion itself and use the existing roads around the area.

8.4.178 During weekend and overnight closures the main increases in traffic flows will occur on roads used as temporary diversion routes, but this will not have a substantial impact on congestion and delays because the underlying baseline traffic flows at these times are lower than the daytime flows on a weekday.

PRoW closures and diversions

8.4.179 Construction of the Proposed Scheme will also require temporary closure and diversion of some PRoW which cross or are affected during the construction period. In order to minimise the disruption to users, closures and diversion have been carefully planned to ensure that wherever possible either the existing or alternative route will be maintained at all times. Table 8-92 summarises the temporary closures and/or diversions that will be required.

Table 8-92: Footpath, cycleway and bridleway closures and diversions

Name	Location	Length of diversion	Alternative route	Duration	Comment
FP M104	Ch157+400 as People Mover viaduct crosses Bickenhill Lane adjacent to airport	200m	Temporary local realignment of Footpath M104 adjacent to Bickenhill Lane will be required	24 months	For the works associated with the people mover construction. Diversion for lifting viaduct beams over highway
FP M96	Ch155+800	100m	Temporary local diversion east of its current alignment	12 months	Temporary local diversion of Footpath M96 adjacent to the A452 Chester Road for approximately 100m east of its current alignment. Footpath M96 will be reinstated to its current permanent alignment upon completion of the drainage works associated with the A452 Chester Road
FP M114	Ch155+800	200m temporary realignment to allow A45/Service Road works.	Temporary diversion for 200m eastwards along A45 Service Road	55 months	Temporary realignment may not be necessary as the footpath finishes in the middle of the A45 Coventry road

Name	Location	Length of diversion	Alternative route	Duration	Comment
Perimeter of Pendigo Lake	Ch156+200	Temporary closure/600m local diversion to allow construction plant access around perimeter of lake	Local diversion approximately 30m to the south of the existing	36 months	To facilitate construction of the People Mover a temporary realignment of the footpath will be required around the southern perimeter of Pendigo Lake, for approximately 450m for a period of three years, adding an additional 20m. The footpath will be reinstated along its existing alignment

* Note - length quoted above is the length of the new section of PRoW and not the distance change for users.

8.4.180 In addition, FP M77 (Green Lane) lies partially within this area but crosses under the scheme in the adjoining area and is assessed in the Coleshill Junction (CFA19).

8.4.181 The impact of the above temporary diversions is discussed below. PRoW or footpaths that are diverted on a permanent basis are discussed in the operational section.

Birmingham interchange and Chelmsley Wood (CFA24) Proposed Scheme assessment of construction impacts

Key transport construction issues

8.4.182 Construction of the Proposed Scheme in the Birmingham Interchange and Chelmsley Wood area will have a number of temporary impacts. These temporary impacts will include increased traffic demand on a number of roads, associated with the construction works and workers accessing construction sites and compounds, and the temporary closure of roads and/or footpaths, requiring diversion routes for users. The following sections consider these impacts in detail.

8.4.183 The construction of the Proposed Scheme will result in an estimated 4,750 vehicle movements (in/out) per day across the study area at peak times. This includes construction vehicle movements which pass through this area to access five adjacent CFAs. The largest of these movements will be to the Balsall Common and Hampton-in-Arden area (CFA23), where there will be approximately 1,400 vehicle trips routed via the strategic road network to Stonebridge Island and the A452 Kenilworth Road, to reduce impacts on villages. Approximately 850 vehicle movements are to the Coleshill Junction area (CFA19), which pass through on the M6 or M42 via the A45 Coventry Road, A452 Chester Road and A446 Stonebridge Road. Traffic to the Birmingham CFAs largely passes through this area on the motorways. The split of construction vehicles is expected to be 47% HGVs and 53% cars and light goods vehicles (LGV).

8.4.184 There is expected to be an impact of traffic management on traffic flows, and consequently delays to vehicles as a result of diversions or traffic congestion, however this is not likely to be substantial. Any temporary traffic management measures would be presented to the HA, SMBC, and WCC in advance to ensure that any impact that would occur is managed and minimised. The proposed road works and associated temporary traffic management measures will be likely to result in reduced capacity and some delays on the M42, M42 junction 6, M6, M6 junction 4, the A45 Coventry Road, A452 Chester Road, A446 Stonebridge Road and A452 Chester Road/A446 Stonebridge Road/Solihull Parkway roundabout. Any lane restrictions will be scheduled to minimise the impacts on traffic in the peak periods with advance notice provided to travellers.

Strategic and local road network

8.4.185 During the construction period there will be a number of roads within the strategic network that will be affected by the construction of the Proposed Scheme through the area. An assessment of the impact of construction related vehicle movements has been undertaken and is detailed below. In the assessments that follow, the flows presented are for the reasonable worst case scenario based on the range of alternatives that have been tested. The flows outlined in the following sections will not necessarily occur concurrently as impacts in different parts of the network will occur at different times.

8.4.186 Table 8-93 below shows a summary of the 2021 future baseline flows for the strategic network in the area together with Proposed Scheme construction traffic flows on links where there is expected to be an impact in the AM peak hour. The table draws on information for the construction assessment months and shows the worst case flows in any given location irrespective of the month in which the flow occurs. The table therefore provides a robust assessment.

Table 8-93: Strategic road network AM peak hour traffic flows 2021 future baseline and with Proposed Scheme construction traffic (vehicles)

Location	Dir	AM peak (08:00-09:00)							
		2021 baseline (veh)		2021 baseline with Proposed Scheme construction traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With Proposed Scheme
A446 (Stonebridge Road) between M6 junction 4 and slips to A452	NB	1160	72	1187	98	2.3%	37.3%	32.2%	33.0%
	SB	2049	127	2075	152	1.2%	20.0%	56.9%	57.6%

Location	Dir	AM peak (08:00-09:00)							
		2021 baseline (veh)		2021 baseline with Proposed Scheme construction traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With Proposed Scheme
A452 (Chester Road) between Birmingham Business Park Roundabout and Melbicks	SB	795	49	811	65	2.0%	32.1%	22.1%	22.5%
	NB	876	54	893	71	1.9%	31.4%	24.3%	24.8%
A446 north of A452 slips	NB	1164	72	1189	97	2.2%	35.2%	32.3%	33.0%
	SB	1304	81	1329	106	1.9%	31.4%	36.2%	36.9%
A452 Between Packington Lane and Stonebridge Island	NB	2018	125	2059	166	2.0%	33.1%	56.1%	57.2%
	SB	2169	134	2210	175	1.9%	30.6%	60.2%	61.4%
A45 east of Stonebridge Island	EB	1783	110	1783	111	0.0%	0.5%	49.5%	49.5%
	WB	2595	160	2595	161	0.0%	0.4%	72.1%	72.1%
A45 between M42 junction 6 and Stonebridge Island	EB	2420	149	2483	213	2.6%	42.3%	43.2%	44.3%
	WB	3024	187	3092	254	2.2%	36.0%	54.0%	55.2%
M42 south of junction 6	NB	5220	303	5323	406	2.0%	33.8%	72.5%	73.9%
	SB	5509	320	5612	423	1.9%	32.0%	76.5%	77.9%
M42 north of junction 6	NB	4182	243	4267	329	2.1%	35.3%	58.1%	59.3%
	SB	5887	342	5974	429	1.5%	25.4%	81.8%	83.0%
M42 junction 6 northbound off slip	NB	2180	127	2232	179	2.4%	41.3%	60.6%	62.0%
M42 junction 6 southbound on slip	SB	1482	86	1534	138	3.6%	60.7%	41.2%	42.6%
A45 west of Damson Parkway	EB	2157	133	2157	133	0.0%	0.3%	59.9%	59.9%
	WB	1853	114	1853	115	0.0%	0.3%	51.5%	51.5%
A45 between Damson Parkway an Clock junction	EB	2213	137	2214	137	0.0%	0.3%	61.5%	61.5%
	WB	2174	134	2175	135	0.0%	0.3%	60.4%	60.4%
A45 between Clock junction and M42 junction 6	EB	2048	126	2048	127	0.0%	0.7%	36.6%	36.6%
	WB	3297	204	3298	204	0.0%	0.4%	58.9%	58.9%
Link from M42 northbound to M6 northbound	NB	1049	61	1088	100	3.7%	63.5%	26.2%	27.2%

Location	Dir	AM peak (08:00-09:00)							
		2021 baseline (veh)		2021 baseline with Proposed Scheme construction traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With Proposed Scheme
M42 north of link road to M6 eastbound	NB	2531	147	2578	194	1.9%	31.9%	45.2%	46.0%
M42 north of link road to M6 eastbound	SB	4609	268	4696	355	1.9%	32.4%	82.3%	83.9%
M6 east of junction 4	WB	3523	205	3523	205	0.0%	0.2%	62.9%	62.9%
M6 junction WB traffic approaching roundabout	WB	594	35	594	35	0.1%	1.1%	10.6%	10.6%
A452 (Kenilworth Road) south of Stonebridge Island	NB	1165	72	1200	108	3.1%	49.7%	32.4%	33.3%
	SB	1382	85	1418	121	2.6%	41.8%	38.4%	39.4%
A452 (Chester Road) north of junction with A446	SB	811	50	827	66	1.9%	31.5%	22.5%	23.0%
A446 Slips from Birmingham Business Park Roundabout	EB	141	9	142	11	1.4%	22.0%	4.2%	4.3%
	WB	745	46	746	47	0.1%	1.5%	22.2%	22.3%
A446 between Coleshill Heath Road and M6 junction 4	SB	1345	83	1364	102	1.4%	22.7%	37.4%	37.9%
	NB	1338	83	1357	101	1.4%	22.8%	37.2%	37.7%
A446 between Coleshill Heath Road and Coventry Road	NB	1444	89	1453	99	0.7%	10.9%	40.1%	40.4%
	SB	1743	108	1752	117	0.6%	9.1%	48.4%	48.7%

8.4.187 Table 8-93 clearly shows that construction traffic will not create any capacity related issues on strategic routes within the area. Where flows are forecast to increase, the overall increase is generally less that 4% on all roads and all roads operate within capacity (all v/c ratios less than 85%). The increase in the proportion of HGV movements is greater in percentage terms but this is generally as a result of the relatively low background flow on these locations.

8.4.188 The most substantial increase in vehicle movements in the AM peak hour is on the M42 south of junction 6 with around 100 additional HGV vehicle movements forecast in each direction in the AM peak hour. These are not expected to have any substantial impact on the operation of the M42 south of junction 6 as this equates to less than a 2% change in the flow on the link and which continues to operate below a v/c ratio of 85%. This increase is also not expected to have an impact on the operation of M42 junction 6 as the amount of construction traffic is relatively small compared to the forecast trips associated with the operation of the Proposed Scheme and for which mitigation has been designed and assessed below. The mitigation will be completed prior to operation of the Proposed Scheme in 2026 and therefore traffic conditions at the junction are expected to be better than future baseline conditions in 2021. It should be noted that this is also the case for the other highway mitigation which is discussed in detail in the operation section.

8.4.189 Table 8-94 shows a summary of the 2021 future baseline flows for the strategic network in the area together with Proposed Scheme construction traffic flows on links where there is expected to be an impact in the PM peak hour. The table draws on information for the construction assessment months and shows the worst case flows in any given location irrespective of the month in which the flow occurs. The table therefore provides a robust assessment.

Table 8-94: Strategic road network PM peak hour traffic flows 2021 future baseline and with Proposed Scheme construction traffic (vehicles)

Location	Dir	PM peak (17:00-18:00)							
		2021 baseline (veh)		2021 baseline with Proposed Scheme construction traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With Proposed Scheme
A446 (Stonebridge Road) between M6 junction 4 and slips to A452	NB	2027	94	2054	121	1.3%	28.3%	56.3%	57.0%
	SB	1720	80	1746	105	1.5%	31.6%	47.8%	48.5%
A452 (Chester Road) between Birmingham Business Park Roundabout and Melbicks	SB	1157	54	1173	70	1.4%	29.3%	32.1%	32.6%
	NB	604	28	621	45	2.8%	60.5%	16.8%	17.2%
A446 north of A452 slips	NB	1354	63	1379	88	1.9%	40.2%	37.6%	38.3%
	SB	1526	71	1552	96	1.7%	35.6%	42.4%	43.1%
A452 Between Packington Lane and Stonebridge Island	NB	1880	87	1921	129	2.2%	47.2%	52.2%	53.4%
	SB	2705	126	2746	167	1.5%	32.6%	75.1%	76.3%

Location	Dir	PM peak (17:00-18:00)							
		2021 baseline (veh)		2021 baseline with Proposed Scheme construction traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With Proposed Scheme
A45 east of Stonebridge Island	EB	2765	128	2766	129	0.0%	0.4%	76.8%	76.8%
	WB	2809	130	2809	131	0.0%	0.4%	78.0%	78.0%
A45 between M42 junction 6 and Stonebridge Island	EB	2932	136	2996	199	2.2%	46.4%	52.4%	53.5%
	WB	3637	169	3704	236	1.9%	39.8%	65.0%	66.2%
M42 south of junction 6	NB	5676	267	5779	370	1.8%	38.4%	78.8%	80.3%
	SB	5950	280	6052	382	1.7%	36.6%	82.6%	84.1%
M42 north of junction 6	NB	5906	278	5992	364	1.5%	30.8%	82.0%	83.2%
	SB	5290	249	5377	336	1.6%	34.9%	73.5%	74.7%
M42 junction 6 northbound off slip	NB	1494	70	1546	123	3.5%	74.3%	41.5%	42.9%
M42 junction 6 southbound on slip	SB	1976	93	2029	145	2.6%	56.2%	54.9%	56.3%
A45 west of Damson Parkway	EB	2422	113	2422	113	0.0%	0.3%	67.3%	67.3%
	WB	2594	120	2594	121	0.0%	0.3%	72.1%	72.1%
A45 between Damson Parkway an Clock junction	EB	2456	114	2457	114	0.0%	0.3%	68.2%	68.2%
	WB	3011	140	3012	140	0.0%	0.2%	83.6%	83.7%
A45 between Clock junction and M42 junction 6	EB	3700	172	3700	173	0.0%	0.5%	66.1%	66.1%
	WB	3530	164	3530	165	0.0%	0.5%	63.0%	63.0%
Link from M42 northbound to M6 northbound	NB	1217	57	1255	96	3.2%	67.6%	30.4%	31.4%
M42 north of link road to M6 eastbound	NB	3934	185	3981	232	1.2%	25.4%	70.2%	71.1%
M42 north of link road to M6 eastbound	SB	4414	208	4501	295	2.0%	41.8%	78.8%	80.4%
M6 west of junction 4	NB	3738	176	3778	216	1.1%	22.7%	66.8%	67.5%
M6 east of junction 4	EB	3745	176	3745	177	0.0%	0.2%	66.9%	66.9%
	WB	3329	157	3330	157	0.0%	0.2%	59.5%	59.5%
M6 junction WB traffic approaching roundabout	WB	411	19	411	20	0.1%	1.9%	7.3%	7.3%

Location	Dir	PM peak (17:00-18:00)							
		2021 baseline (veh)		2021 baseline with Proposed Scheme construction traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With Proposed Scheme
A452 (Kenilworth Road) south of Stonebridge Island	NB	1344	62	1380	98	2.7%	57.2%	37.3%	38.3%
	SB	1604	74	1639	110	2.2%	47.9%	44.5%	45.5%
A452 (Chester Road) north of junction with A446	SB	1117	52	1132	68	1.4%	30.4%	31.0%	31.5%
A446 Slips from Birmingham Business Park Roundabout	EB	706	33	708	35	0.3%	5.8%	21.1%	21.1%
	WB	194	9	195	10	0.4%	7.9%	5.8%	5.8%
A446 between Coleshill Heath Road and M6 junction 4	SB	1281	59	1299	78	1.5%	31.7%	35.6%	36.1%
	NB	2023	94	2042	113	0.9%	20.1%	56.2%	56.7%
A446 between Coleshill Heath Road and Coventry Road	NB	1977	92	1987	102	0.5%	10.6%	54.9%	55.2%
	SB	1421	66	1431	76	0.7%	14.8%	39.5%	39.7%

8.4.190 Table 8-94 shows a similar pattern of impacts in the PM peak hour. Again, the overall increase is generally less that 4% on all roads and all roads operate within capacity (all v/c ratios less than 85%). The most substantial increase in vehicle movements in the PM peak hour is again on the M42 south of junction 6 with around 100 additional HGV vehicle movements forecast in each direction in the PM peak hour. These are not expected to have any substantial impact on the operation of the M42 south of junction 6 or on M42 junction 6 itself.

8.4.191 Table 8-95 shows a summary of the 2021 future baseline flows for the strategic network in the area together with Proposed Scheme construction traffic flows on links where there is expected to be an increase on a daily basis (based on 18-hr AAWT flows). The table draws on information for the construction assessment months and shows the worst case flows in any given location irrespective of the month in which the flow occurs. The table therefore provides a robust assessment.

Table 8-95: Strategic road network 18-hr daily traffic flows 2021 future baseline and with Proposed Scheme construction traffic (vehicles)

Location	2021 baseline (veh)		2021 baseline with Proposed Scheme construction traffic		Percentage impact	
	veh	HGV	Veh	HGV	veh	HGV
A446 Slips from Birmingham Business Park Roundabout	5657	281	5687	288	0.5%	2.5%
A446 Slips to Birmingham Business Park Roundabout	6275	312	6293	319	0.3%	2.3%
A452 (Chester Road) north of junction with A446	9885	491	10106	491	2.2%	0.0%
A452 (Chester Road) north of junction with A446	12881	640	13091	797	1.6%	24.6%
M6 south bound off slip at junction 4	11795	621	12010	621	1.8%	0.0%
Link from M42 northbound to M6 northbound	14756	777	15154	777	2.7%	0.0%
M42 junction 6 northbound off slip	23931	1259	24936	1782	4.2%	41.5%
M42 junction 6 southbound on slip	22524	1185	23516	1708	4.4%	44.1%
M6 junction 4 on slip	7694	405	7790	409	1.3%	0.9%
M6 junction 4 through junction traffic WB	28419	1496	28447	1496	0.1%	0.0%
M6 junction WB traffic approaching roundabout	6544	344	6645	348	1.5%	1.1%
A446 between Coleshill Heath Road and Coventry Road	43990	2185	44209	2380	0.5%	8.9%
A446 between Coleshill Heath Road and M6 junction 4	40000	1987	40781	2364	2.0%	19.0%
M6 west of junction 4	84980	4472	85752	4472	0.9%	0.0%
M6 east of junction 4	89292	4699	89549	4707	0.3%	0.2%
A446 (Stonebridge Road) between M6 junction 4 and slips to A452	46481	2309	48008	2816	3.3%	22.0%
A446 (Stonebridge Road) between M6 junction 4 and slips to A452	46481	2309	48008	2816	3.3%	22.0%
A45 between Damson Parkway an Clock junction	65845	3271	66075	3278	0.4%	0.2%
A45 west of Damson Parkway	60303	2996	60537	3003	0.4%	0.2%
A452 (Chester Road) between Birmingham Business Park Roundabout and Melbicks	22932	1139	23363	1454	1.9%	27.7%

Location	2021 baseline (veh)		2021 baseline with Proposed Scheme construction traffic		Percentage impact	
	veh	HGV	Veh	HGV	veh	HGV
M42 north of link road to M6 eastbound	100881	5309	102629	6248	1.7%	17.7%
A446 north of A452 slips	35730	1775	37221	2280	4.2%	28.5%
A446 between Coleshill Heath Road and M6 junction 4	35730	1775	37221	2280	4.2%	28.5%
A446 north of A452 slips	35730	1775	37221	2280	4.2%	28.5%
M6 junction 4 on slip	7607	400	7832	400	3.0%	0.0%
A452 Between Packington Lane and Stonebridge Island	58607	2911	60520	3734	3.3%	28.3%
A452 Between Packington Lane and Stonebridge Island	58607	2911	60520	3734	3.3%	28.3%
A45 east of Stonebridge Island	66489	3303	66656	3314	0.3%	0.3%
A452 (Kenilworth Road) south of Stonebridge Island	36712	1824	38259	2538	4.2%	39.2%
A45 between M42 junction 6 and Stonebridge Island	80269	3987	83101	5288	3.5%	32.6%
M42 south of junction 6	145615	7663	148438	8939	1.9%	16.7%
A45 between Clock junction and M42 junction 6	84005	4173	84296	4190	0.4%	0.4%
M42 north of junction 6	138513	7290	140658	8229	1.6%	12.9%

8.4.192 Table 8-95 shows that the construction of the Proposed Scheme is not expected to have a substantial impact on strategic routes through the area. The biggest impact during construction is expected to be on the M42 south of junction 6, A45 Coventry Road west of Stonebridge Island, A452 Chester Road and the A446 Stonebridge Road which are expected to see an additional 1500-2850 vehicle movements per day of which around 40% are expected to be HGV movements. In the context of forecast 2021 future baseline flows, these additional vehicles equate to around an increase of between 2%-5% in all vehicle movements and between 12%-39% in HGV movements.

8.4.193 The increase in traffic on the M42 is forecast to be around 2,823 vehicle movements a day (two-way) of which 1,276 vehicle movements a day (two-way) are expected to be HGVs. This equates to an increase in total traffic demand of less than 2% although the number of HGVs increases by just under 17%. It should be noted that whilst the number of HGVs increases by 17%, the impact of this is not expected to be substantial as the overall proportion of HGVs along this section increases from 5.3% to 6.0% of total traffic. The increases in traffic are consistent with this being part of the strategic route into the area which construction vehicles will use to access the construction compounds.

8.4.194 The increase in traffic on the A45 Coventry Road is forecast to be around 2,832 vehicle movements a day (two-way) of which 1,301 vehicle movements a day (two-way) are expected to be HGVs. This equates to an increase in total traffic demand of less than 4% although the number of HGVs increases by just under 33%. It should be noted that whilst the number of HGVs increases by 33%, the impact of this is not expected to be substantial as the overall proportion of HGVs along this section increases from 5.0% to 6.4% of total traffic. The increases in traffic are consistent with this being part of the strategic route into the area which construction vehicles will use to access the construction compounds.

8.4.195 The increase in traffic on the A452 Chester Road is forecast to be around 1,912 vehicle movements a day (two-way) of which 823 vehicle movements a day (two-way) are expected to be HGVs. This equates to an increase in total traffic demand of less than 3% although the number of HGVs increases by just under 29%. It should be noted that whilst the number of HGVs increases by 29%, the impact of this is not expected to be substantial as the overall proportion of HGVs along this section increases from 5.0% to 6.2% of total traffic. The increases in traffic are consistent with this being part of the strategic route into the area which construction vehicles will use to access the construction compounds.

8.4.196 Table 8-97 shows a summary of the 2021 future baseline flows for the local network in the area together with Proposed Scheme construction traffic flows on links where there is expected to be an impact in the AM peak hour. The table draws on information for the construction assessment months and shows the worst case flows in any given location irrespective of the month in which the flow occurs. The table therefore provides a robust assessment.

Table 8-96: Local road network AM peak hour traffic flows 2021 future baseline and with Proposed Scheme construction traffic (vehicles)

Location	Dir	AM peak (08:00-09:00)							
		2021 baseline (veh)		2021 baseline with Proposed Scheme Construction Traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With Proposed Scheme
A45 westbound service road between east Way and M42 junction 6	WB	196	5	201	10	2.7%	110.2%	8.5%	8.8%
east Way on link from A45 slip after Diddington Lane	NB	48	1	57	10	18.4%	740.5%	3.2%	3.8%
east Way	EB	129	3	138	13	7.2%	290.6%	5.1%	5.5%
east Way link to A45 eastbound off slip at Stonebridge Island	EB	165	4	175	13	5.7%	226.8%	22.1%	23.3%
south Way between M42 junction 6 and Pendigo Way	NB	491	15	493	17	0.5%	16.6%	7.7%	7.7%
	SB	167	5	169	7	1.4%	44.4%	2.6%	2.6%
B4438 between Northway and Birmingham Business Park Roundabout	NB	712	22	713	23	0.2%	6.6%	11.1%	11.1%
	SB	603	18	605	20	0.2%	7.7%	9.4%	9.4%
Bickenhill Lane between Station Link Road and Clock junction	NB	1335	40	1335	41	0.1%	1.5%	20.9%	20.9%
	SB	977	30	977	30	0.1%	2.1%	15.3%	15.3%
Link from A45 slip to Bickenhill Lane	NB	507	15	507	0	0.0%	-99.7%	49.7%	49.7%
Airport Way between Viking Road and Bickenhill Lane	EB	491	15	491	15	0.0%	0.3%	7.7%	7.7%
	WB	322	10	322	10	0.0%	0.4%	5.0%	5.0%
A45 eastbound on slip from Airport roundabout	EB	344	21	344	22	0.1%	1.7%	33.7%	33.7%
A45 westbound off slip to Airport Roundabout	WB	703	43	703	44	0.1%	0.8%	22.0%	22.0%
Airport Way between Viking Road and Hermes Road	NB	733	18	733	19	0.1%	2.2%	11.4%	11.5%
	SB	602	15	602	15	0.1%	2.6%	9.4%	9.4%

8.4.197 Table 8-96 clearly shows that construction traffic will not create any capacity related issues on local routes within the area in the AM peak hour. Where flows are forecast to increase, the roads are all well within capacity (all v/c ratios less than 85%). Where the percentage increase is shown to be large, this is consequence of the low background flows. This is particularly evident when considering HGV movements where there are some substantial percentage increases however in no location is the peak hour impact expected to result in an additional HGV movement by more than every six minutes. This is therefore not considered to be substantial.

8.4.198 Table 8-97 shows a summary of the 2021 future baseline flows for the local network in the area together with Proposed Scheme construction traffic flows on links where there is expected to be an impact in the PM peak hour. The table draws on information for the construction assessment months and shows the worst case flows in any given location irrespective of the month in which the flow occurs. The table therefore provides a robust assessment.

Table 8-97: Local road network PM peak hour traffic flows 2021 future baseline and with Proposed Scheme construction traffic (vehicles)

Location	Dir	PM peak (17:00-18:00)							
		2021 baseline (veh)		2021 baseline with Proposed Scheme Construction Traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With Proposed Scheme
A45 westbound service road between east Way and M42 junction 6	WB	91	2	96	7	5.9%	353.9%	4.0%	4.2%
east Way on link from A45 slip after Diddington Lane	NB	33	1	42	9	26.6%	1591.3%	2.2%	2.8%
east Way	EB	90	2	100	11	10.4%	620.3%	3.6%	3.9%
east Way link to A45 eastbound off slip at Stonebridge Island	EB	129	2	138	11	7.3%	435.0%	17.1%	18.4%
south Way between M42 junction 6 and Pendigo Way	NB	267	6	269	8	0.9%	43.5%	4.2%	4.2%
	SB	278	6	280	8	0.8%	37.9%	4.3%	4.4%
B4438 between Northway and	NB	630	13	632	15	0.2%	10.5%	9.8%	9.9%

Location	Dir	PM peak (17:00-18:00)							
		2021 baseline (veh)		2021 baseline with Proposed Scheme Construction Traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With Proposed Scheme
Birmingham Business Park Roundabout	SB	480	10	482	12	0.3%	13.8%	7.5%	7.5%
Bickenhill Lane between Station Link Road and Clock junction	NB	643	14	644	14	0.1%	4.6%	10.1%	10.1%
	SB	1817	39	1818	39	0.0%	1.6%	28.4%	28.4%
Link from A45 slip to Bickenhill Lane	NB	385	8	385	0	0.0%	-99.5%	37.8%	37.8%
Airport Way between Viking Road and Bickenhill Lane	EB	766	16	766	16	0.0%	0.3%	12.0%	12.0%
	WB	342	7	342	7	0.0%	0.6%	5.4%	5.4%
A45 eastbound on slip from Airport roundabout	EB	911	42	911	43	0.0%	0.8%	89.3%	89.4%
A45 westbound off slip to Airport Roundabout	WB	815	38	815	38	0.0%	0.9%	25.5%	25.5%
Airport Way between Viking Road and Hermes Road	NB	854	14	855	15	0.1%	2.8%	13.3%	13.4%
	SB	1099	18	1100	19	0.0%	2.2%	17.2%	17.2%

8.4.199 As with the AM peak hour, Table 8-97 shows that construction traffic will not create any capacity related issues on local routes within the area. The only location which has a v/c ratio of greater than 85% is the A45 eastbound on slip from Airport roundabout. The impact on this link is only a single HGV movement in the PM peak and is therefore not considered to be a substantial impact.

8.4.200 Table 8-98 shows a summary of the 2021 future baseline flows for the local network in the area together with Proposed Scheme construction traffic flows on links where there is expected on a daily basis (based on 18-hr AAWT flows). The table draws on information for the construction assessment months and shows the worst case flows in any given location irrespective of the month in which the flow occurs. The table therefore provides a robust assessment.

Table 8-98: Local network 18-hr daily traffic flows 2021 future baseline and with Proposed Scheme construction traffic (vehicles)

Location	2021 baseline (veh)		2021 baseline with Proposed Scheme construction traffic		Percentage impact	
	veh	HGV	veh	HGV	veh	HGV
A45 westbound service road between Stonebridge Island and east Way	2709	52	2820	52	4.1%	0.0%
A45 westbound service road between east Way and M42 junction 6	1930	37	2041	91	5.7%	145.1%
east Way on link from A45 slip after Diddington Lane	547	11	951	87	73.8%	728.6%
east Way	1474	28	1885	110	27.9%	287.4%
east Way link to A45 eastbound off slip at Stonebridge Island	1976	38	2379	119	20.4%	214.4%
south Way between M42 junction 6 and Pendigo Way	8268	244	8415	291	1.8%	19.4%
B4438 between Northway and Birmingham Business Park Roundabout	16679	493	16742	521	0.4%	5.8%
Bickenhill Lane between Station Link Road and Clock junction	32811	969	32860	982	0.1%	1.3%
Link from A45 slip to Bickenhill Lane	6131	181	6133	181	0.0%	0.2%
Airport Way between Viking Road and Bickenhill Lane	13206	390	13211	391	0.0%	0.2%
A45 eastbound on slip from Airport roundabout	8383	416	8401	420	0.2%	0.9%
A45 westbound off slip to Airport Roundabout	10139	504	10158	507	0.2%	0.7%
Airport Way between Viking Road and Hermes Road	22108	425	22150	433	0.2%	1.9%
Coleshill Heath Road between Yorkminster Drive and Stonebridge Road	17036	503	17596	685	3.3%	36.2%

8.4.201 Table 8-98 shows that the construction of the Proposed Scheme is not expected to have a substantial impact on local routes through the area. The most substantial impact during construction are on Eastway and on Coleshill Heath Road between Yorkminster Drive and A446 Stonebridge Road which lies largely in the Coleshill junction area.

8.4.202 The increase in traffic on Eastway is forecast to be around 411 vehicle movements a day (two-way) of which 81 vehicle movements a day (two-way) are expected to be HGVs. This equates to an increase in total traffic demand of just under 28% although the number of HGVs increases by around 288%. These percentage increases are large due to the low level of background flow.

8.4.203 The increase in traffic on Coleshill Heath Road is forecast to be around 560 vehicle movements a day (two-way) of which 182 vehicle movements a day (two-way) are expected to be HGVs. This equates to an increase in total traffic demand of just under 4% although the number of HGVs increases by around 36%. The percentage of HGV movements as a proportion of total traffic increases from 3.0% to 3.9% during construction. These percentage increases are not considered substantial in the context of the existing background flows.

Accidents and safety

8.4.204 The baseline safety assessment identified no locations at which there have been nine or more accidents over the last three year period and there are no safety analyses and reports for the future baseline assessment.

8.4.205 Whist increases in traffic have the potential to result in an increase in accidents, it is not expected that there will be any substantial traffic related safety related issues during construction.

Parking

8.4.206 During construction of Proposed Scheme, there will be an impact on the surface car parking at a number of locations which will result in a temporary loss of spaces. Table 8-99 summarises the anticipated losses.

Table 8-99: Temporary car parking impacts

Location	Loss of spaces	Duration (months)
NEC	720	12
Birmingham International Station	290	24
west Car Park	200	24
Birmingham Airport	280*	24

* designated spaces (any space allocated for a dedicated use such as taxi, disabled user, car hire etc)

8.4.207 The loss of spaces at the NEC is associated with the construction of the automated People Mover. It is not expected that the impact of the loss would be substantial as there is a large amount of car parking at the NEC and the estimated loss equates to less than 4% of the total available stock of car parking at the NEC. The estimated loss is expected to be an over-estimate and detailed phasing of the works including could potentially reduce the loss of spaces and/or the duration over which spaces are lost.

8.4.208 The loss of spaces at the Birmingham International Rail station is also associated with the construction of the automated People Mover. It is estimated that around 13% of the spaces at Birmingham International Rail station would be temporarily lost. Generally, there is space available at Birmingham International Rail station such that the impact of the loss will not be substantial. As with the NEC, estimated loss is expected to be an over-estimate and detailed phasing of the works including could potentially reduce the loss of spaces and/or the duration over which spaces are lost.

8.4.209 The loss of spaces at the west Car Park is also associated with the construction of the automated People Mover and is not expected to be substantial.

8.4.210 The loss of spaces at the Birmingham Airport is also associated with the construction of the automated People Mover. It is not expected that the impact of the loss would be substantial as there is a substantial amount of car parking at Birmingham Airport and the estimated loss equates to just over 1% of the total available stock of car parking at the Birmingham Airport. However, the lost spaces are designated spaced comprising of up to 60 taxi holding bays and 220 car hire bays. Again, the estimated loss is expected to be an over-estimate and detailed phasing of the works including could potentially reduce the loss of spaces and/or the duration over which spaces are lost. Both taxi holding and car hire have occupied a number of different locations within the airport site and therefore it is anticipated that could be relocated temporarily within the wider airport site.

8.4.211 The construction of the new A452 Chester Road/ Solihull Parkway roundabout will also result in a loss of approximately 37 car parking spaces at Fujitsu in the Birmingham Business Park. The impact of this is not expected to be substantial.

8.4.212 The realignment of the A446 Stonebridge Road will result in a loss of approximately 54 car parking spaces at Melbicks Garden & Leisure Centre. The impact of the temporary parking loss will be moderate.

8.4.213 In addition to the parking impacts identified above, there could be temporary impacts on loading bays at the NEC and Birmingham Airport during construction however the impact is not expected to be substantial relative to the total number of loading areas at the facilities.

8.4.214 HS2 Ltd will work with the businesses affected to identify opportunities where reasonably practical to mitigate impacts on parking and loading by the use of land acquired for the Proposed Scheme. Where this is possible alternative provision will mitigate these parking impacts.

Rail

8.4.215 Planned possession of the classic rail network is a standard technique widely used for the maintenance of the UK railway. A number of standard possessions are used which vary in duration depending on the scale and complexity of the works planned. These range from mid-week night (23:00 – 0500) possessions, through weekend 54 hour (23:00 Friday – 05:00 Monday) possessions to Bank Holiday weekend 100 hour (01:00 Friday – 05:00 Tuesday) possessions. Longer periods in exceptional circumstances are occasionally planned.

8.4.216 Proposed Scheme works will be undertaken in compliance with the Proposed Scheme Construction Code of Practice and the Network Rail Rule Book to ensure that disruption to travelling passengers and freight is minimised as far as possible. This includes measures such as carefully programming Proposed Scheme works to coincide with possessions that are required and planned for the general maintenance of the railway, planning of the required works so that they can be undertaken in short overnight stages when passenger services are not disrupted and programming longer closures at the weekend and on bank holidays to minimise the number of passengers affected.

8.4.217 The construction of the Proposed Scheme in the Birmingham Interchange and Chelmsley Wood area will require temporary possessions of existing rail infrastructure, in order to construct the automated people mover link over the west Coast Main Line at Birmingham International Station. The construction will require interface with Network Rail in relation to the safe operation of the existing railway. Works will typically be carried out in non-disruptive possessions and where this is not possible, possessions and blockades will be agree through close working with Network Rail to ensure that disruption is minimised. Table 8-100 summarises the expected possessions in the area.

Table 8-100: Rail possessions for CFA24

Location and scope	Type of interface	CFA ref:	Number and length of possessions	When occur during construction
Birmingham Interchange	To accommodate civil engineering	CFA24	160 all 4 hour mid-week night possessions	May 2018 to May 2021

8.4.218 However, only overnight possessions and do not therefore disrupt the travelling public.

8.4.219 Rail possessions in adjacent areas also have the potential to disrupt travellers in the area. It is understood that generally possessions in adjoining areas would be limited in nature by duration and timeframe to generally weekend, off-peak and overnight possessions to minimise the impact on rail travellers. Rail replacement services would also be provided as necessary when rail possessions were in place.

8.4.220 This will not have a substantial impact on rail trips in this area.

Local bus and coach services

8.4.221 In the Birmingham Interchange and Chelmsley Wood area, the impact during construction of the Proposed Scheme on local bus services will be largely along the A45 Coventry Road, M42 junction 6, and at Birmingham International Station, where Birmingham International Station serves as a public transport and multi modal interchange and around the A452 Chester Road/B4438 Bickenhill Parkway roundabout.

8.4.222 The No 900 (Birmingham to Coventry) service uses the A45 Coventry Road and will be affected by the construction of the A45 overbridges and associated traffic management during construction. The construction of the A45 overbridges is expected to be phased so to ensure that connectivity is maintained throughout construction (with the exception of the short-term/overnight closures identified above). As a result, any impact on the operation of the No 900 service is expected to be not substantial although minor revisions to timetables may be required to allow for any additional travel time due to traffic management.

8.4.223 The No B90 (Birmingham International Station to Blythe Valley Park) service will be affected by the capacity improvement to M42 junction 6 and associated traffic management during construction. The construction works are expected to be phased so to ensure that connectivity is maintained throughout construction (with the exception of the short-term/overnight closures identified above). As a result, any impact on the operation of the No B90 service is expected to be not substantial although minor revisions to timetables may be required to allow for any additional travel time due to traffic management.

8.4.224 The 777 bus service (Hams Hall to Birmingham International Station) service will be affected by the works required to replace the existing A452 Chester Road/B4438 Bickenhill Parkway roundabout and associated traffic management during construction. Construction is largely off-line and any construction works are expected to be phased so to ensure that connectivity is maintained throughout construction (with the exception of the short-term/overnight closures identified above). As a result, any impact on the operation of the No 777 service is expected to be not substantial although minor revisions to timetables may be required to allow for any additional travel time due to traffic management.

8.4.225 In addition, the bus services calling at the multi-modal interchange at Birmingham International Station (including Nos 91, 97A, 777, 900, B90, 966 and 966A) will be affected by the construction of the automated people mover link and may need to allow more time to access the station and multi modal interchange. There may also need to be temporary traffic management arrangements and/or diversions via Bickenhill Lane during construction of the automated people mover link. The diversions are not expected to be substantial, as road closures are proposed at night, when general network conditions are well within capacity and services are generally not operating (with the exception of No 97A). There the impact on passenger delays is not expected to be substantial.

8.4.226 In the Birmingham Interchange and Chelmsley Wood area, the impact during construction of Proposed Scheme on national coach services will be concentrated around M42 junction 6, A45 Coventry Road, the multi-modal interchange at Birmingham International Station and Birmingham Airport. Any impact on coach services is expected to be not substantial although minor revisions to timetables may be required to allow for any additional travel time due to traffic management.

Public transport interchanges

8.4.227 During construction of Proposed Scheme, there will not be any substantial impact on the operations of the multi modal interchange at Birmingham International Station, although users may need to allow more time to access the multi modal interchange and there may need to be temporary traffic management arrangements or diversions via Bickenhill Lane during construction of the automated people mover link (i.e. where it crosses the west Coast Main Line and Station Link Road, the main access road into the multi modal interchange from the B4438 Bickenhill Lane).

Pedestrians, cyclists and equestrians

8.4.228 The need to disrupt existing PRoW and roads to enable construction has been discussed above. This section considers the impact on pedestrians, cyclists and equestrians (non-motorised users) during construction as a result of temporary disruption to PRoW or roads.

8.4.229 It should be noted that during construction of the Proposed Scheme, it is expected that connectivity for non-motorised users will be maintained either via existing connections or the alternative routes that have been identified. This section seeks to consider the impact on users of any temporary changes.

8.4.230 Table 8-101 below summarises the change in distance which users experience as a result of disruption to a PRoW or roadside footway in the area.

Table 8-101: Impact on vulnerable users as a result of construction of Proposed Scheme

Location	Distance change (m)	Journey time change (mins)	Number affected (per day)
FP M104	0	0.0	n/a
FP M96	0	0.0	n/a
FP M114	150	1.8	0
A45 westbound	0	0.0	7
A45 eastbound	0	0.0	6
Packington Lane	0	0.0	23
Pendigo Way	0	0.0	Variable (dependant on show at NEC)

8.4.231 Table 8-101 shows that there will be no impact on users of these routes in terms of any additional distance or time.

8.4.232 There are dedicated cycling facilities along the A45 Coventry Road, west of the Stonebridge Island as well as cycle facilities on Stonebridge Island itself. During construction, there will be impacts during on the A45 Coventry Road and Stonebridge Island due to the construction of the A45 overbridges and capacity improvements to Stonebridge Island. Notwithstanding this, it is proposed to maintain connectivity throughout construction and to minimise the impact on users through the area. It is therefore not expected that there will be any substantial construction activity impacts on cycling facilities in the Birmingham Interchange and Chelmsley Wood area, other than where they affect PRoW and/or road diversions, which are identified above.

8.4.233 There are no construction activity impacts on equestrians in the Birmingham Interchange and Chelmsley Wood area, other than where they affect PRoW and/or road diversions, which are identified above.

Taxis

8.4.234 Construction of the automated People Mover will require the temporary loss/relocation of taxi facilities at Birmingham Airport. The route of the automated People Mover will require the route to pass through an area that is presently designated at Birmingham Airport as a taxi holding area before taxis move forward to the taxi rank. The taxi holding area has space for approximately 50 taxis and the loss of spaces will be dependent on detailed design. The airport site has a substantial amount on on-site car parking and the taxi holding area has been located in a number of different locations over time. It is therefore not expected that the construction of the automated People Mover will have a substantial impact. HS2 will work with Birmingham Airport to ensure that any disruption is minimised.

Waterway and canals

8.4.235 There are no navigable waterways or canals in the Birmingham Interchange and Chelmsley Wood area and, therefore, no construction activity impacts on navigable waterways and canals in the Birmingham Interchange and Chelmsley Wood area.

Air transport

8.4.236 During construction of Proposed Scheme, there will not be any impact on aircraft operations at Birmingham Airport, although users of Birmingham Airport may need to allow more time to access the Airport.

8.4.237 During construction of the automated people mover link, and its terminus at the Airport, a satellite construction compound is to be located in the Airport's Car Hire Pick-Up/Return Area, which will require its temporary relocation, to a site to be designated by the Airport. In addition, construction of the automated people mover link may require temporary traffic management arrangements on the Airport's landside internal circulatory roads within the Passenger Terminal Site (including Airport Way), together with temporary traffic management arrangements for the airside Perimeter Road adjacent to the Passenger Terminal. With a satellite construction compound at the Airport, there will also be construction traffic using Airport Way, to access the compound, where Airport Way is the Passenger Terminal Site's only access road.

8.4.238 The overall impact, during construction of Proposed Scheme, on Birmingham Airport is not considered to be substantial.

Mitigation impacts

8.4.239 The following measures (as described in Section 2) have been included as part of the engineering design of the Proposed Scheme and will avoid or reduce impacts on transport users:

- creation of a haul road running north/south from the neighbouring Balsall Common and Hampton-in-Arden (CFA23) to just south of the existing A452 Chester Road/A446 Stonebridge Road/Solihull Parkway roundabout;
- construction materials and equipment will be transported along the haul road adjacent to the Proposed Scheme alignment, where reasonably practicable, to reduce lorry movements on the public highway;
- the majority of roads crossing the Proposed Scheme will be kept open during construction resulting in minimal diversions of traffic onto alternative routes;
- restricting road closures to overnights and weekends where reasonably practicable;
- construction of a new alignment on the A452 Chester Road, and the replacement for the A452 Chester Road/A446 Stonebridge Road/Solihull Parkway roundabout before closure of the existing roads;
- Heavy Goods Vehicles (HGV) routeing, as far as reasonably practicable, along the strategic road network, and using designated routes for access, as shown on Maps TR-03-154 to TR-03-155a (Volume 5, Map Book ;Traffic and Transport).
- temporary diversion for one PRoW and one footpath;
- provision of temporary worker accommodation at the Birmingham Interchange for workers not normally based locally; and
- provision of on-site welfare facilities to reduce daily travel by site workers.

8.4.240 The draft CoCP (see Volume 5: Appendix CT-003-000/1) includes measures which seek to reduce the impacts of deliveries of construction materials and equipment, including reducing construction lorry trips during peak background traffic periods. The draft CoCP includes HGV management and control measures.

8.4.241 Where reasonably practicable, the number of private car trips to and from the site (both workforce and visitors) will be reduced by encouraging alternative modes of transport or vehicle sharing. This will be supported by an over-arching framework travel plan that will require travel plans to be used along with a range of potential measures to mitigate the impacts of traffic and transport movements associated with construction of the Proposed Scheme. As part of this, a construction workforce travel plan will be put into operation with the aim of reducing workforce commuting by private car, especially sole occupancy car travel. Construction and operational travel plans will promote the use of sustainable transport modes as appropriate to the location and types of trip. They will include measures such as: provision of information on and promotion of public transport services; provision of good cycle and pedestrian facilities; liaison with public transport operators; promotion of car sharing; and the appointment of a travel plan coordinator to ensure suitable measures are in place and are effective.

8.4.242 The measures in the draft CoCP include clear controls on vehicle types, hours of site operation, and routes for HGV to reduce the impact of road based construction traffic. In order to achieve this, generic and site specific traffic management measures will be implemented during the construction of the Proposed Scheme on or adjacent to public roads, bridleways, footpaths and other PRoW affected by the Proposed Scheme, as necessary.

8.4.243 Specific measures will include:

- core site operating hours will be 08:00 to 18:00 on weekdays and 08:00 to 13:00 on Saturdays and site staff and workers will therefore generally arrive before the AM peak hour and depart after the PM peak hour (draft CoCP, Section 5). Sites associated with tunnelling works (e.g. Bromford tunnel in the Castle Bromwich and Bromford area (CFA25)) will be operational 24 hours a day, however it is anticipated that shift changeover times would not coincide with the highway peak hours;
- excavated material will be reused wherever reasonably practicable along the route of the Proposed Scheme which will reduce the impacts of construction vehicles on the public highway;

8.4.244 Where works potentially affect Network Rail assets, disruption to travelling passengers and freight movements will be minimised as far as possible. This includes measures such as:

- carefully programming works to coincide with possessions that are required and planned for the general maintenance of the railway;

- planning of the required works so that they can be undertaken in short overnight stages when passenger services are not disrupted; and
- programming longer closures at the weekend and on bank holidays to minimise the number of passengers affected.

Construction impacts summary

8.4.245 Table 8-102 provides a summary of the issues by mode in the Birmingham Interchange and Chelmsley Wood area.

Table 8-102: Construction; summary of issues

Mode	Issue
	2021
Highway	Impact during construction on a number of routes which provide access to construction sites however, no capacity related impact expected on strategic routes through the area. No capacity related impacts on local roads. No capacity impacts at junctions.
Public Transport	No substantial impact on strategic or local rail network. There may be some disruption due to rail possessions but these are expected to be managed to minimise disruption and will mainly be weekend, off peak and overnight periods. Rail replacement services will be provided where necessary and appropriate. Bus/Coach network; no impacts expected although allowance for additional journey time due to traffic management measures may be advisable. Public Transport Interchange; no substantial impacts expected although minor impact due to temporary traffic management should be expected.
Pedestrian, Cyclists and Equestrians	No substantial impacts on PRoW, all impacts will be managed through localised temporary diversions. Pedestrians may experience some increased difficulty in crossing some roads due to increased construction traffic movements however number of pedestrians in this area is low. No impacts on cyclists or equestrian users other than those identified for PRoW.
Waterways	No impact on waterways - no navigable waterways in the area.
Parking	Temporary loss of parking spaces at the NEC, Birmingham International station, west car park, Birmingham Airport and National Motorbike Museum. Designated spaces, including car hire and taxi spaces lost and may require temporary relocation of taxi holding area during construction of the people mover.
Air Transport	No issue

Birmingham interchange and Chelmsley Wood Proposed Scheme operation description

Description of Proposed Scheme in CFA

8.4.246 The Proposed Scheme has been described in detail above. The Proposed Scheme includes the new station at Birmingham Interchange, the people mover and associated highway works. This section provides a summary of the key changes.

8.4.247 The Proposed Scheme includes the local realignment and/or reconfiguration of highways A452 Chester Road/A446 Stonebridge Road/B4438 Bickenhill Parkway, A452 Chester Road, A446 Stonebridge Road, A45 Coventry Road and the stopping-up of Middle Bickenhill Lane. Table 8-102 summarise highways which are to be permanently closed and details new/modified highways in order to facilitate the Proposed Scheme (the tables do not include a description of the further highway mitigation measures that are required to address the additional traffic movements generated by the Proposed Scheme).

Table 8-103: Permanent highway diversion/stopping-up

Highway	Diversion length	Reason for diversion/stopping-up
Middle Bickenhill Lane (see CT-06-106, Volume 2, Map Book 24)	up to 3,100m via A45 Coventry Road and A452 Chester Road	Construction of Proposed Scheme – multiple elements. No replacement provided. southern section of road maintained for access to existing properties.

Table 8-104: New and modified highways/junctions in CFA24

New/modified highway or junction	Description
A45(T) Coventry Road and adjacent service roads (see CT-06-105b, Volume 2, Map Book 24)	Existing dual 3-lane A45 Coventry Road between M42 junction 6 and Stonebridge Island widened to dual 4 lanes and raised online above Proposed Scheme to provide clearance for Proposed Scheme. Height above existing varies to a maximum of approximately 5m Existing eastbound and westbound service roads adjacent to the A45 Coventry Road are permanently diverted offline and raised above Proposed Scheme to provide clearance for Proposed Scheme.
A452 Chester Road and southern Station Access junction (see CT-06-105b and CT-06-106, Volume 2, Map Book 24)	Existing dual 2-lane carriageway permanently diverted offline to the east of existing carriageway and widened to dual 3 lanes between Stonebridge Island and the southern station access junction New southern station access junction providing access to the Interchange station. The station entry slip road is from the A452 Chester Road northbound and the station exit slip road is onto the A452 southbound.

New/modified highway or junction	Description
A452 Chester Road/A446 Stonebridge Road roundabout and connecting roads (see CT-06-106 and CT-106-07, Volume 2, Map Book 24)	Existing roundabout over the M42 is demolished to allow construction of Proposed Scheme M42 Viaduct with a replacement roundabout provided approximately 750m south eastwards. The new roundabout is situated over Proposed Scheme and reconnects the severed road network with the following connections. New/realigned link roads to connect to the A452 Chester Road northbound and southbound. New roads to connect to the interchange station and car parks. New A452 link road over the M42. New A446 link roads. New access to access Melbicks Garden Centre and Quartz Point. New roundabout providing access to Birmingham Business Park and with realigned connections to the A452 Chester Road and B4438 Bickenhill Parkway. Existing B4438 Bickenhill Parkway /Northway roundabout enlarged and realigned to provide access to the B4438 Bickenhill Parkway, Northway and new A452 link road over the M42. Associated footpaths.
New Interchange Internal Road Network (see CT-06-106, Volume 2, Map Book 24)	A network of internal roads is required to provide access to the interchange station and car parks either side of Proposed Scheme. These connect to the new A452/A446 roundabout and the southern station access junction. Associated footpath and cycle links.

8.4.248 The Proposed Scheme also includes the permanent diversion of a number of PRoW which are summarised in Table 8-105.

Table 8-105; Permanent PRoW diversions

PRoW	Length of diversion	Reason for diversion
Footpath M114 (see CT-06-105b, Volume 2, Map Book 24)	-30m	Minor amendment to footpath M114 to tie-in with the realigned A45 Coventry Road
Footpath M96 (see CT-06-105b, Volume 2, Map Book 24)	-20m	Minor amendment to footpath M92 to tie-in with the realigned A452 Chester Road
Footpath M105 (see CT-06-107, Volume 2, Map Book 24)	-20m	Minor amendment to footpath M105 to tie-in with the realigned access to Melbicks

Operation forecast trip assumptions

Distribution

8.4.249 Highway trips generated by Interchange station were distributed on to highway network based on PLANET data. The main corridors are summarised in Table 8-106.

Table 8-106: Forecast Interchange station trip distribution – highway trips

Origin/destination	2026		2041	
	Boarders	Alighters	Boarders	Alighters
M42 South/Solihull, Warwick. Leamington	35%	35%	34%	34%
A452 South/Kenilworth/Balsall Common	11%	11%	11%	11%
A45 East/Coventry	10%	10%	11%	11%
M6 North/Sutton Coldfield, Tamworth, Nuneaton	10%	10%	11%	11%
A45 West/Birmingham	8%	8%	9%	9%

8.4.250 The Proposed Scheme will include facilities to enable bus services to stop at Birmingham Interchange station. It is expected that the majority of bus users will be from Solihull (50-60%) and Birmingham (25-35%) in the peak hours.

Changes in demand 2026 and 2041

8.4.251 The demand for travel generated by the Proposed Scheme has been considered in detail earlier in the report. The Proposed Scheme will generate vehicle traffic as a result of Birmingham Interchange Station. This section provides a brief overview of the expected demand before the report goes on to consider the impact of these trips on the Birmingham Interchange and Chelmsley Wood area.

8.4.252 The total passenger demand, along with the number of people travelling by each mode of transport to/from Birmingham Interchange station is shown in Table 8-107.

Table 8-107: Approximate Birmingham Interchange station person trips per mode

Demand/mode	2026 (Phase One)		2041 (Phase Two)	
	AM peak hour	PM peak hour	AM peak hour	PM peak hour
	Boarders/Alighters	Boarders/Alighters	Boarders/Alighters	Boarders/Alighters
Total Proposed Scheme Passengers	1963	2098	3467	3696
Car (parked)	932	1095	1621	1893
Kiss and Ride	186	74	324	128
Taxi	103	190	178	330
People Mover (comprising of):				
Bus*	75	84	131	146
Walk/Cycle	141	101	244	175

Other Trains	437	471	817	883
People Mover on to Airport	89	82	154	141

8.4.253 Table 8-110 shows that with the introduction of the Proposed Scheme in 2026, there will be approximately 1,950 rail passengers boarding, alighting and interchanging at Birmingham Interchange station in the AM peak hour and around 2,100 rail passengers boarding, alighting and interchanging at Birmingham Interchange station in the PM peak hour.

8.4.254 For 2041, with the full Phase Two operation, these numbers are forecast to numbers increase to approximately 3,450 passengers using Birmingham Interchange station in the AM peak hour and approximately 3,700 passengers in the PM peak hour through increased train frequency and additional national rail destinations. This equates to an increase in demand of around 77% in the AM peak hour and 80% in the PM peak hour.

8.4.255 Table 8-108 shows the primary origins and destinations of the passenger boarding and alighting at Birmingham Interchange station in 2026 and 2041.

Table 8-108: Primary origin and destination of trips travelling through Birmingham Interchange and Chelmsley Wood

Origin/destination	**2026**	**2041**
	Boarders/Alighters	**Boarders/Alighters**
Solihull, Warwick and Leamington	35%	34%
Kenilworth/Balsall Common	11%	11%
Coventry	10%	11%
Sutton Coldfield, Tamworth, Nuneaton	10%	11%
Birmingham	8%	8%
Other (less than 5% to any destination)	26%	24%

8.4.256 Table 8-108 shows that there is not expected to be a substantial change in the distribution of trips between 2026 and 2041 with broadly the same proportions attracted from each area. The table shows that the largest proportion of trips will come from the Solihull, Warwick and Leamington areas with around a third of the demand generated from these areas. It is also worth noting that around one-quarter of all trips are expected to be distributed away from the main areas showing that demand for Proposed Scheme will be drawn from wide and diverse areas.

Birmingham interchange and Chelmsley Wood Proposed Scheme assessment of operation impacts

Key operation transport issues

8.4.257 As part of its design, the Proposed Scheme includes the following measures to reduce the impacts on transport users in the Birmingham Interchange and Chelmsley Wood area:

- the design of the Birmingham Interchange station has been sized to include sufficient concourse and platform space to accommodate passenger growth to 2041 (which relates to the Proposed Scheme Phase Two) and beyond;
- the design of Birmingham Interchange station will include the following dedicated transport facilities which are shown on Figure 8-8 below:
  - bus/coach stops;
  - taxi drop off and pick up area;
  - kiss and ride drop-off area;
  - car parking; and pedestrian and cycle facilities;
  - a people mover to provide connectivity between Birmingham Interchange station, the NEC, Birmingham International station, Birmingham Airport and business parks in the area (Figure 8-9). The people mover will also provide a link to the existing bus routes serving Birmingham International station and Birmingham Airport. The people mover has been designed to provide high capacity, fast and efficient connections;
  - multiple access routes from the highway network including access via the M6 junction 4 for passengers from the north, access via M42 junction 6 for passengers from the south, and access from the A45 Coventry Road for passengers from the east and west;
  - replacement of the A452 Chester Road/A446 Stonebridge Road/Solihull Parkway roundabout with new access roads and three new roundabouts to maintain access and connectivity;
  - an underbridge at Coleshill Heath Road; and
  - an overbridge at the A45 Coventry Road, A45 Service Road and east Way.

Figure 8-8: Proposed layout of Birmingham Interchange station

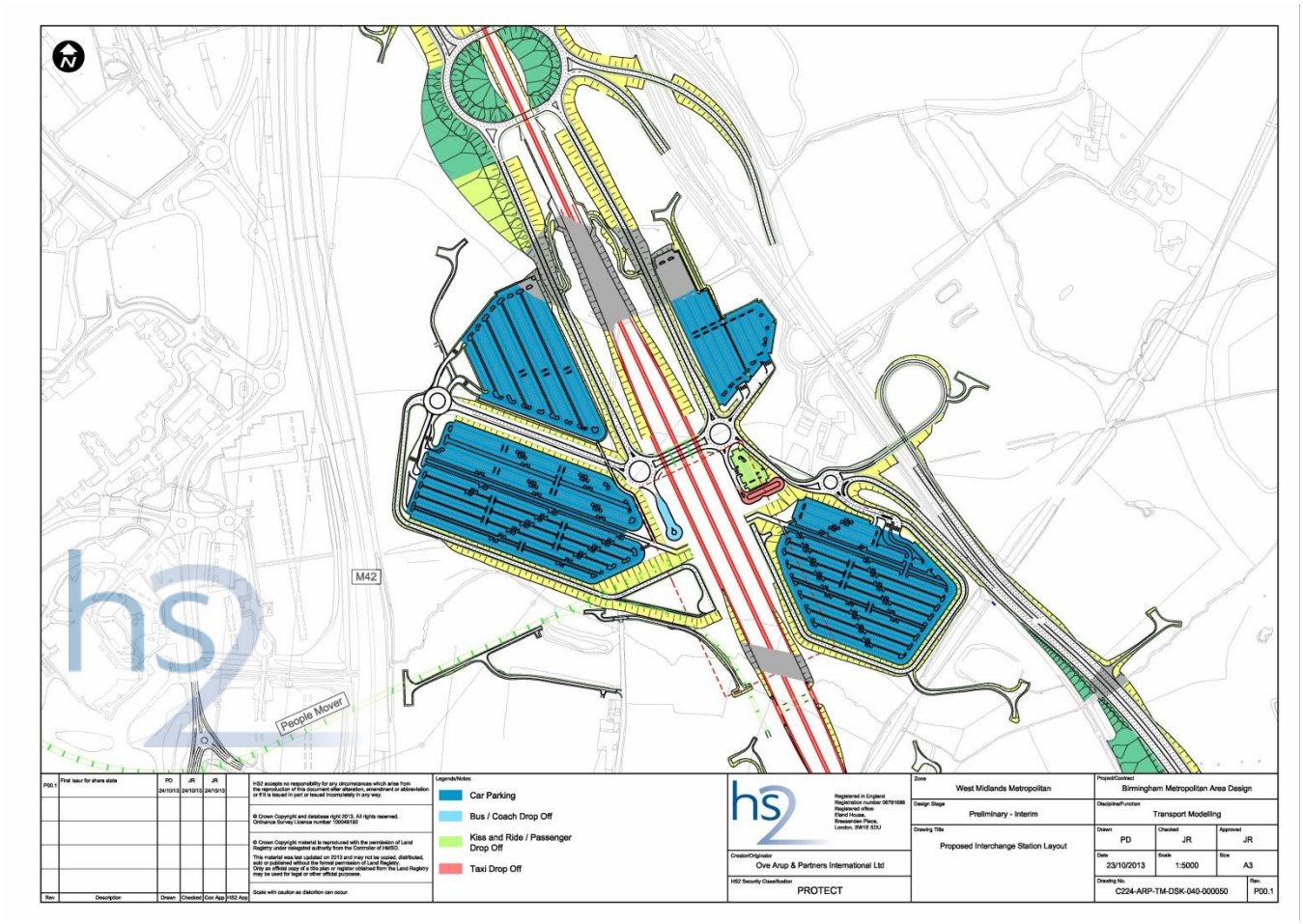
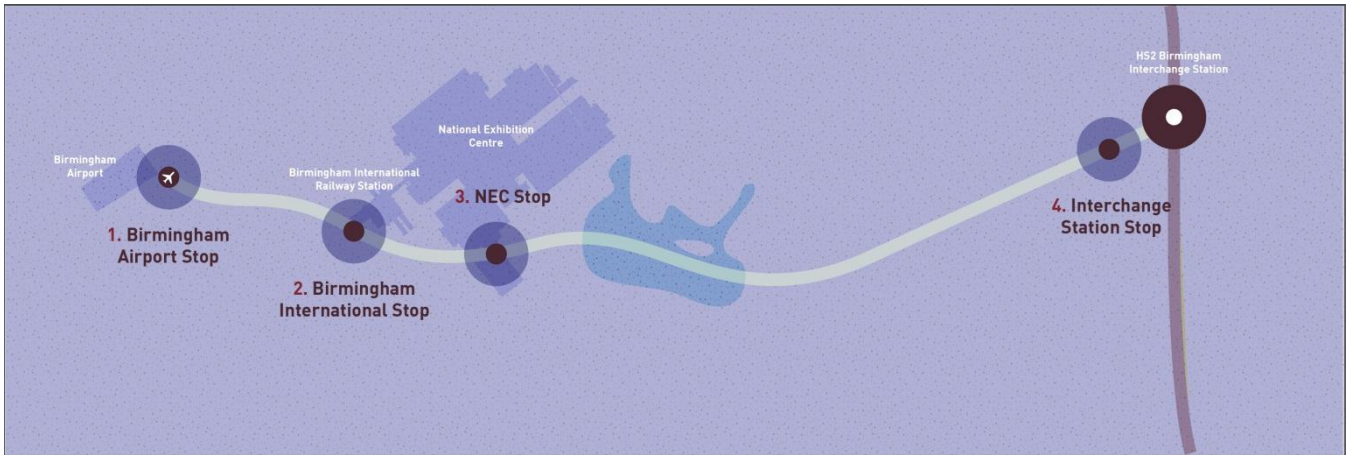


Figure 8-9: Proposed People Mover stations



8.4.258 A framework travel plan will set out how travel plans will be required to mitigate the impacts of traffic and transport movements associated with the maintenance and operation of the Proposed Scheme. In relation to this area, an operational station travel plan will be implemented which seeks to further mitigate travel impacts from Birmingham Interchange station by promoting the use of sustainable modes by both workers and passengers. It should be noted that no assessment of the potential reduction in highway trips has been undertaken as part of this Transport Assessment thereby ensuring that the impacts are robustly assessed.

8.4.259 In terms of the transport network in the Birmingham Interchange and Chelmsley Wood area, the Proposed Scheme will also result in:

- an increase in rail capacity on the west Coast Main Line;
- passenger demands accessing the new Birmingham Interchange station with increases in traffic on the surrounding highway network;
- realignment of highways to facilitate the Proposed Scheme;
- the closure of Middle Bickenhill Lane; and
- amendments to PRoW and roadside footpaths.

8.4.260 In addition, occasional traffic may access areas of the Proposed Scheme for maintenance purposes, but such infrequent vehicle movements are anticipated to be very low and, therefore, will have a negligible impact on the strategic and local highway networks.

8.4.261 The following sections consider the transport impacts of the above in the area.

Local land uses

8.4.262 The Proposed Scheme will not result in any substantial change of land use as the Proposed Station is located on primarily undeveloped land. The alignment of the people mover will result in changes to the car parking provision at the NEC, Birmingham International Station, Birmingham Airport and Birmingham Business Park. The impact of these changes is assessed in the relevant section on car parking below.

Strategic and local road network traffic flows 2026

8.4.263 The Birmingham Interchange station will generate traffic on the road network. The following sections consider the traffic impact of these addition trips on the strategic network through the area.

8.4.264 This section summarises the increases in traffic on the strategic road network in 2026 as a result of the Proposed Scheme, together with the assessment of the impacts. Table 8-109 below shows a summary of the 2026 future baseline flows together with the 2026 Proposed Scheme flows on completion of the Proposed Scheme in the AM peak hour.

Table 8-109: Strategic road network AM peak hour traffic flows 2026 future baseline and with Proposed Scheme traffic (vehicles)

Location	Dir	AM peak (08:00-09:00)							
		2026 baseline (veh)		2026 baseline with Proposed Scheme traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With Proposed Scheme
A446 (Stonebridge Road) between M6 junction 4 and slips to A452	NB	1186	73	1230	73	3.7%	0.0%	32.9%	34.2%
	SB	2095	129	2265	129	8.1%	0.0%	58.2%	62.9%
A446 north of A452 slips	NB	1189	73	1190	73	0.1%	0.0%	33.0%	33.1%
A452 Between Packington Lane and Stonebridge Island	NB	2063	127	2898	127	40.5%	0.0%	57.3%	55.7%
	SB	2217	137	2427	137	9.5%	0.0%	61.6%	46.7%
A45 east of Stonebridge Island	EB	1822	113	1853	113	1.7%	0.0%	50.6%	51.5%
	WB	2652	164	2769	164	4.4%	0.0%	73.7%	76.9%
A45 between M42 junction 6 and Stonebridge Island	EB	2474	153	3062	153	23.8%	0.0%	44.2%	54.7%
	WB	3091	191	3238	191	4.7%	0.0%	55.2%	57.8%
M42 south of junction 6	NB	5247	305	5636	305	7.4%	0.0%	72.9%	78.3%
	SB	5538	322	5636	322	1.8%	0.0%	76.9%	78.3%
M42 north of junction 6	NB	4203	244	4210	244	0.2%	0.0%	58.4%	58.5%
	SB	5918	344	5938	344	0.3%	0.0%	82.2%	82.5%
A452 (Chester Road) between Birmingham Business Park Roundabout and Coleshill Heath Road	SEB	1528	94	1588	94	3.9%	0.0%	96.1%	99.9%
	NWB	588	36	604	36	2.7%	0.0%	37.0%	38.0%
M42 junction 6 northbound off slip	NB	2190	127	2577	127	17.7%	0.0%	60.8%	71.6%
A45 west of Damson Parkway	EB	2204	136	2294	136	4.1%	0.0%	61.2%	63.7%
	WB	1894	117	1919	117	1.3%	0.0%	52.6%	53.3%
A45 between Damson Parkway an Clock junction	EB	2262	140	2444	140	8.0%	0.0%	62.8%	67.9%
	WB	2222	137	2271	137	2.2%	0.0%	61.7%	63.1%

Location	Dir	AM peak (08:00-09:00)							
		2026 baseline (veh)		2026 baseline with Proposed Scheme traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With Proposed Scheme
A45 between Clock junction and M42 junction 6	EB	2093	129	2275	129	8.7%	0.0%	37.4%	40.6%
	WB	3370	208	3418	208	1.4%	0.0%	60.2%	61.0%
M42 north of link road to M6 eastbound	NB	2544	148	2549	148	0.2%	0.0%	45.4%	45.5%
	SB	4633	269	4653	269	0.4%	0.0%	82.7%	83.1%
M6 west of junction 4	SB	2778	161	2887	161	3.9%	0.0%	49.6%	51.6%
	NB	3390	197	3424	197	1.0%	0.0%	60.5%	61.1%
M6 east of junction 4	EB	3128	182	3136	182	0.3%	0.0%	55.9%	56.0%
	WB	3541	206	3574	206	1.0%	0.0%	63.2%	63.8%
M6 south bound off slip at junction 4	SB	974	57	1082	57	11.1%	0.0%	27.1%	30.1%
M6 junction 4 on slip	EB	432	25	439	25	1.6%	0.0%	12.0%	11.0%
	WB	460	27	489	27	6.3%	0.0%	12.8%	12.2%
M6 junction WB traffic approaching roundabout	WB	597	35	628	35	5.2%	0.0%	10.7%	11.2%
A452 (Kenilworth Road) south of Stonebridge Island	NB	1190	73	1323	73	11.1%	0.0%	33.1%	36.7%
	SB	1413	87	1448	87	2.5%	0.0%	39.2%	40.2%
A446 Slips from Birmingham Business Park Roundabout	EB	144	9	187	9	29.9%	0.0%	4.3%	5.6%
	WB	762	47	932	47	22.3%	0.0%	22.7%	27.8%
A446 between Coleshill Heath Road and M6 junction 4	SB	1375	85	1406	85	2.3%	0.0%	38.2%	42.0%
	NB	1367	84	1374	84	0.5%	0.0%	38.0%	41.0%
A446 between Coleshill Heath Road and Coventry Road	NB	1476	91	1483	91	0.5%	0.0%	41.0%	41.2%
	SB	1781	110	1812	110	1.7%	0.0%	49.5%	50.3%
Chester Road west of Coleshill Heath Road	EB	1503	93	1563	93	4.0%	0.0%	47.0%	48.8%
	WB	1079	67	1095	67	1.5%	0.0%	33.7%	34.2%

8.4.265 Table 8-109 clearly shows that traffic associated with the operation of the Proposed Scheme will only have a limited impact in terms of flows on the strategic network. The most substantial impacts are on roads closest to Birmingham Interchange station and on the route to and from the M42 south. Traffic flows on the A452 Chester Road between Stonebridge Island and Packington Lane are forecast to increase by around 41% (840 vehicle trips) northbound and 9% southbound (210 vehicle trips). Traffic flows on the A45 Coventry Road between Stonebridge Island and M42 junction 6 are forecast to increase by around 24% (590 vehicle trips) eastbound and 5% westbound (150 vehicle trips). Traffic flows on the M42 south of junction 6 are forecast to increase by around 7% (390 vehicle trips) northbound and 2% southbound (100 vehicle trips). Traffic flows on the A45 Coventry Road west of M42 junction 6 are forecast to increase by around 9% (180 vehicle trips) eastbound and 1% westbound (50 vehicle trips). Traffic flows on the M6 north of junction 4 are forecast to increase by around 1% (30 vehicle trips) northbound and 4% southbound (110 vehicle trips). Traffic flows on the M6 south of junction 4 are forecast to increase by around 1% (30 vehicle trips) westbound.

8.4.266 The impact of these increases on the operation of the network is considered in greater detail below using the VISSIM model.

8.4.267 Table 8-110 shows a summary of the 2026 future baseline flows together with the 2026 Proposed Scheme flows on completion of the Proposed Scheme in the PM peak hour.

Table 8-110: Strategic road network PM peak hour traffic flows 2026 future baseline and with Proposed Scheme traffic (vehicles)

Location	Dir	PM peak (17:00-18:00)							
		2026 baseline (veh)		2026 baseline with Proposed Scheme traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With Proposed Scheme
A446 (Stonebridge Road) between M6 junction 4 and slips to A452	NB	2064	96	2227	96	7.9%	0.0%	57.3%	61.9%
	SB	1752	81	1766	81	0.8%	0.0%	48.7%	49.1%
A446 north of A452 slips	SB	1554	72	1555	72	0.0%	0.0%	43.2%	43.2%
A452 Between Packington Lane and Stonebridge Island	NB	1914	89	1988	89	3.9%	0.0%	53.2%	38.2%
	SB	2754	128	3531	128	28.2%	0.0%	76.5%	67.9%
A45 east of Stonebridge Island	EB	2815	131	2927	131	4.0%	0.0%	78.2%	81.3%
	WB	2860	133	2872	133	0.4%	0.0%	79.4%	79.8%
A45 between	EB	2986	139	3038	139	1.8%	0.0%	53.3%	54.3%

Location	Dir	PM peak (17:00-18:00)							
		2026 baseline (veh)		2026 baseline with Proposed Scheme traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With Proposed Scheme
M42 junction 6 and Stonebridge Island	WB	3704	172	4244	172	14.6%	0.0%	66.1%	75.8%
M42 south of junction 6	NB	5832	274	5868	274	0.6%	0.0%	81.0%	81.5%
	SB	6113	288	6481	288	6.0%	0.0%	84.9%	90.0%
M42 north of junction 6	NB	6068	286	6087	286	0.3%	0.0%	84.3%	84.5%
	SB	5435	256	5437	256	0.0%	0.0%	75.5%	75.5%
A452 (Chester Road) between Birmingham Business Park Roundabout and Coleshill Heath Road	SEB	685	32	691	32	0.9%	0.0%	43.1%	43.5%
	NWB	1221	57	1277	57	4.6%	0.0%	76.8%	80.3%
M42 junction 6 northbound off slip	NB	1531	72	1567	72	2.4%	0.0%	42.5%	43.5%
A45 west of Damson Parkway	EB	2466	115	2475	115	0.3%	0.0%	68.5%	68.7%
	WB	2641	123	2727	123	3.3%	0.0%	73.4%	75.8%
A45 between Damson Parkway an Clock junction	EB	2501	116	2516	116	0.6%	0.0%	69.5%	69.9%
	WB	3066	142	3240	142	5.7%	0.0%	85.2%	90.0%
A45 between Clock junction and M42 junction 6	EB	3767	175	3782	175	0.4%	0.0%	67.3%	67.5%
	WB	3594	167	3768	167	4.8%	0.0%	64.2%	67.3%
M42 north of link road to M6 eastbound	NB	4041	190	4060	190	0.5%	0.0%	72.2%	72.5%
	SB	4536	213	4538	213	0.1%	0.0%	81.0%	81.0%
M6 west of junction 4	SB	3258	153	3271	153	0.4%	0.0%	58.2%	58.4%
	NB	3841	181	3944	181	2.7%	0.0%	68.6%	70.4%
M6 east of junction 4	EB	3848	181	3880	181	0.8%	0.0%	68.7%	69.3%
	WB	3421	161	3424	161	0.1%	0.0%	61.1%	61.1%
M6 south bound off slip at junction 4	SB	865	41	875	41	1.2%	0.0%	24.0%	24.3%
M6 junction 4 on	EB	772	36	802	36	3.9%	0.0%	21.4%	20.0%

Location	Dir	PM peak (17:00-18:00)							
		2026 baseline (veh)		2026 baseline with Proposed Scheme traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With Proposed Scheme
slip	WB	729	34	831	34	14.0%	0.0%	20.3%	20.8%
M6 junction WB traffic approaching roundabout	WB	422	20	424	20	0.5%	0.0%	7.5%	7.6%
A452 (Kenilworth Road) south of Stonebridge Island	NB	1369	64	1381	64	0.9%	0.0%	38.0%	38.3%
	SB	1633	76	1759	76	7.7%	0.0%	45.4%	48.9%
A446 Slips from Birmingham Business Park Roundabout	EB	719	33	882	33	22.7%	0.0%	21.5%	26.3%
	WB	197	9	211	9	7.1%	0.0%	5.9%	6.3%
A446 between Coleshill Heath Road and M6 junction 4	SB	1304	61	1306	61	0.2%	0.0%	36.2%	39.0%
	NB	2060	96	2091	96	1.5%	0.0%	57.2%	62.4%
A446 between Coleshill Heath Road and Coventry Road	NB	2013	94	2044	94	1.5%	0.0%	55.9%	56.8%
	SB	1447	67	1449	67	0.1%	0.0%	40.2%	40.2%
Chester Road west of Coleshill Heath Road	EB	793	37	799	37	0.8%	0.0%	24.8%	25.0%
	WB	1506	70	1562	70	3.7%	0.0%	47.1%	48.8%

8.4.268 Table 8-110 shows that there are a number of locations where the v/c ratios are exceeding 85% indicating that the network is approaching capacity. The most substantial impacts are again on roads closest to Birmingham Interchange station and on the route to and from the M42 south. Traffic flows on the A452 Chester Road between Stonebridge Island and Packington Lane are forecast to increase by around 28% (780 vehicle trips) northbound and 4% southbound (75 vehicle trips). Traffic flows on the A45 Coventry Road between Stonebridge Island and M42 junction 6 are forecast to increase by around 2% (50 vehicle trips) eastbound and 15% westbound (540 vehicle trips). Traffic flows on the M42 south of junction 6 are forecast to increase by around 1% (35 vehicle trips) northbound and 6% southbound (370 vehicle trips).

8.4.269 Traffic flows on the A45 Coventry Road west of M42 junction 6 are forecast to increase by around 1% (15 vehicle trips) eastbound and 6% westbound (170 vehicle trips). Traffic flows on the M6 north of junction 4 are forecast to increase by around 3% (100 vehicle trips) northbound. Traffic flows on the M6 south of junction 4 are forecast to increase by around 1% (30 vehicle trips) eastbound.

8.4.270 The impact of these increases on the operation of the network is considered in greater detail below using the VISSIM model.

8.4.271 The reconfiguration of the road network around the A452 Chester Road/A446 Stonebridge Road/Solihull Parkway roundabout will result in a diversion of up to 1.5km, depending on the origin and destination of the journey. The reconfiguration will have a moderate impact on journey times, although this will only affect a small number of users. The impact of the re-configuration on the operation of the network is considered in greater detail below using the VISSIM model.

8.4.272 This section summarises the increases in traffic on local roads in the area in 2026 as a result of the Proposed Scheme, together with the assessment of the impacts.

8.4.273 Table 8-111 shows a summary of the 2026 future baseline flows for the local roads on which there is an impact forecast together with the 2026 Proposed Scheme flows on completion of the Proposed Scheme in the AM peak hour.

Table 8-111: Local road network AM peak hour traffic flows 2026 future baseline and with Proposed Scheme traffic (vehicles)

Location	Dir	AM peak (08:00-09:00)							
		2026 baseline (veh)		2026 baseline with Proposed Scheme traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With Proposed Scheme
south Way between M42 junction 6 and Pendigo Way	SB	175	5	180	5	2.9%	0.0%	5.5%	5.6%
Northway between north Avenue and north Car Park roundabout	SB	239	7	244	7	2.1%	0.0%	10.4%	10.6%
B4438 between Northway and Birmingham Business Park Roundabout	NB	746	23	3033	23	306.7%	0.0%	23.3%	94.8%
Damson Parkway	NB	772	23	864	23	11.9%	0.0%	58.5%	65.5%
	SB	634	19	658	19	3.8%	0.0%	48.1%	49.9%

8.4.274 Table 8-111 clearly shows that traffic will not create any capacity related issues on local routes within the area. The most substantial increase is on the B4438 Bickenhill Parkway which sees a 307% increase in traffic. This increase is largely related to the reconfiguration of highways to accommodate the Proposed Scheme.

8.4.275 In addition to the impact of traffic generated by the Proposed Scheme on the local network, there will be an impact as a result of the closure of Middle Bickenhill Lane, required to facilitate the Proposed Scheme itself. The closure will result in a diversion of between 1.5km and 2.5km (depending on the direction travelled). The permanent closure of Middle Bickenhill Lane will result in the re-routeing of around 25 vehicles in the AM and PM peak hours. The Middle Bickenhill Lane closure will have no material impact on the overall traffic flows.

8.4.276 The impact of these increases on the operation of the network is considered in greater detail below using the VISSIM model.

8.4.277 Table 8-112 below shows a summary of the 2026 future baseline flows for the local roads on which there is an impact forecast together with the 2026 Proposed Scheme flows on completion of the Proposed Scheme in the PM peak hour.

Table 8-112: Local road network PM peak hour traffic flows 2026 future baseline and with Proposed Scheme traffic (vehicles)

Location	Dir	PM peak (17:00-18:00)							
		2026 baseline (veh)		2026 baseline with Proposed Scheme traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	with Proposed Scheme
south Way between M42 junction 6 and Pendigo Way	SB	283	6	302	6	6.7%	0.0%	8.9%	9.5%
Northway between north Avenue and north Car Park roundabout	SB	125	3	144	3	15.2%	0.0%	5.4%	6.3%
B4438 between Northway and Birmingham Business Park Roundabout	NB	643	14	1010	14	57.1%	0.0%	20.1%	31.5%
Damson Parkway	NB	729	22	736	22	1.0%	0.0%	55.2%	55.7%
	SB	646	20	734	20	13.6%	0.0%	48.9%	55.6%

8.4.278 Table 8-112 again shows that the Proposed Scheme will not create any capacity related issues on local routes within the area. As with the AM peak, the most substantial increase is on the B4438 Bickenhill Parkway which sees a 57% increase in traffic.

8.4.279 The largest increases (greater than 10%) in peak hour traffic flows on the strategic and local in 2026 on the road network local to Birmingham Interchange station as a result of the Proposed Scheme are:

- M42 junction 6 northbound off-slip where the demand in traffic flows will increase in 2026 by approximately 18% in the AM peak hour;
- M6 junction 4 westbound on-slip where traffic flows will increase in 2026 by approximately 14% in the PM peak hour;
- A45 Coventry Road, between Clock Island and Stonebridge Island where traffic flows will increase in 2026 by up to approximately 13% in the AM peak hour;
- A45 Coventry Road eastbound on-slip and westbound off-slip at M42 junction 6 where traffic flows will increase in 2026 by up to approximately 24% in the AM peak hour and by approximately 19% in the PM peak hour;
- A45 Coventry Road eastbound and westbound on/off-slips at Stonebridge Island where the traffic flows will increase in 2026 by between approximately 13% and 44% in the AM peak hour and between approximately 12% and 37% in the PM peak hour;
- A446 Stonebridge Road, between M6 junction 4 and the merge with the A452 Chester Road where traffic flows will increase in 2026 by up to approximately 24% in the AM peak hour and by up to approximately 19% in the PM peak hour;
- A452 Chester Road Between Packington Lane and Stonebridge Island where traffic flows will increase in 2026 by approximately 24% in the AM peak hour and by approximately 18% in the PM peak hour;
- B4438 Bickenhill Parkway, between Northway and the new A452 Chester Road/Solihull Parkway roundabout where traffic flows will increase in 2026 by approximately 161% in the AM peak hour and by approximately 103% in the PM peak hour; and
- Northway, between the North Car Park Roundabout and Bickenhill Parkway where traffic flows will increase in 2026 by approximately 25% in the AM peak hour and by approximately 26% in the PM peak hour.

Network Modelling 2026

8.4.280 This section considers the impact of traffic generated by the Proposed Scheme in the area on the highway network. The Birmingham Interchange VISSIM model, described earlier in the report has been used to assess the changes in network conditions as a result of trips to and from Birmingham Interchange station.

Network Performance

8.4.281 Table 8-113 summarises the performance of the network in 2026 without the Proposed Scheme (future baseline) and with Proposed Scheme but not including any highway mitigation to address the additional trips for the AM peak hour.

Table 8-113: Birmingham Interchange area VISSIM model 2026 AM peak hour network performance indicators - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

Parameter	AM peak (08:00-09:00)	
	Future baseline	Proposed Scheme (no mitigation)
Average delay time per vehicle [s], All Vehicle Types	74.8	120.5
Average number of stops per vehicles, All Vehicle Types	1	3
Average speed [mph], All Vehicle Types	37.7	33.5
Average stopped delay per vehicle [s], All Vehicle Types	15	27
Total delay time [h], All Vehicle Types	760	1271
Total Distance Travelled [km], All Vehicle Types	215714	229017
Number of Stops, All Vehicle Types	52061	101042
Number of vehicles in the network, All Vehicle Types	3663	4695
Number of vehicles that have left the network, All Vehicle Types	32915	33278
Total stopped delay [h], All Vehicle Types	156	284
Total travel time [h], All Vehicle Types	3558	4245
Unreleased Vehicles	158	439

8.4.282 Table 8-113 shows that without mitigation average delays as a result of the Proposed Scheme are expected to increase in 2026 by 61% and average vehicle speeds fall by 4.2mph to 33.5mph as a result of additional traffic generated by Proposed Scheme. A further consequence of the increased demand is that the number of unreleased vehicles increases from 0.4% in the future baseline to 1.2% with Proposed Scheme (no mitigation). Table 8-114 summarises the locations at which vehicles are unreleased in 2026 future baseline and with Proposed Scheme (no mitigation) scenarios in the AM peak hour.

Table 8-114: Birmingham Interchange area VISSIM model AM peak hour unreleased vehicles - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

	2026 future baseline		2026 with Proposed Scheme (no mitigation)	
AM peak (08:00-09:00)	Unreleased vehicles	Proportion of demand	Unreleased vehicles	Proportion of demand
A45 Coventry Rd west of Damson Parkway (EB)	157	6.9%	281	11.9%
Damson Parkway	1	0.1%	32	3.9%
Viking Way	3	1.2%	204	13.4%

	2026 future baseline		2026 with Proposed Scheme (no mitigation)	
AM peak (08:00-09:00)	**Unreleased vehicles**	**Proportion of demand**	**Unreleased vehicles**	**Proportion of demand**
A446 Stonebridge Road north (SB)	-	-	2	0.1%
A452 Chester Road north (SB)	-	-	124	8.7%

8.4.283 Table 8-114 shows that without mitigation in the AM peak hour there are still a limited, albeit increasing number of locations in which the model is unable to assign the total demand.

8.4.284 Table 8-115 summarises the performance of the network for the PM peak hour.

Table 8-115: Birmingham Interchange area VISSIM model PM peak hour network performance indicators - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

Parameter	**PM peak (17:00-18:00)**	
	Future baseline	**Proposed Scheme (no mitigation)**
Average delay time per vehicle [s], All Vehicle Types	87.9	279.1
Average number of stops per vehicles, All Vehicle Types	2	8.7
Average speed [mph], All Vehicle Types	37.0	22.6
Average stopped delay per vehicle [s], All Vehicle Types	23	111
Total delay time [h], All Vehicle Types	980	3164
Total Distance Travelled [km], All Vehicle Types	241202	214945
Number of Stops, All Vehicle Types	92882	356388
Number of vehicles in the network, All Vehicle Types	4603	8399
Number of vehicles that have left the network, All Vehicle Types	35515	32650
Total stopped delay [h], All Vehicle Types	260	1249
Total travel time [h], All Vehicle Types	4047	5952
Unreleased Vehicles	601	3196

8.4.285 Table 8-115 shows that without mitigation average delays as a result of the Proposed Scheme are expected to increase in 2026 by 218% and average vehicle speeds reduce by 14.4mph to 22.6mph in PM peak hour. These changes arise as a result of the increased demand for travel through the network generated by Proposed Scheme. The table above that the number of unreleased vehicles increases from 1.5% in the future baseline to 7.8% with Proposed Scheme (no mitigation). Table 8-116 summarises the locations at which vehicles are unreleased in 2026 future baseline and with Proposed Scheme (no mitigation) scenarios in the PM peak hour.

Table 8-116: Birmingham Interchange area VISSIM model PM peak hour unreleased vehicles - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

	2026 future baseline		2026 with Proposed Scheme (no mitigation)	
PM peak (17:00-18:00)	**Unreleased vehicles**	**Proportion of demand**	**Unreleased vehicles**	**Proportion of demand**
A45 Coventry Rd west of Damson Parkway (EB)	-	-	605	24.8%
Damson Parkway	29	3.9%	755	6.4%
Terminal Road	-	-	18	5.9%
Catherine-de-Barnes Lane	-	-	2	0.4%
M42 south (NB)	494	7.4%	800	11.7%
A452 Kenilworth Road (NB)	-	-	101	8.9%
A45 Birmingham Road east (WB)	-	-	412	14.9%
Starlet Way	-	-	123	31.8%
Elmdon Trading Estate	-	-	53	26.1%
Airport Way (Long Stay Car Park)	-	-	237	30.8%
Viking Way (Long Stay Car Park)	-	-	41	27.7%
Station Link Road	-	-	325	36.6%
Solihull Business Park	320	21.5%	-	-
Motorcycle Museum Exit	76	74.2%	29	27.2%
M42 north (SB)	1	0.0%	983	15.1%
Coleshill Road	-	-	33	8.3%
Harbet Drive	-	-	27	24.9%
Perimeter Road	-	-	47	26.6%
M6 east	-	-	323	8.0%

8.4.286 Table 8-116 shows that in the PM peak hour there are more locations where the model is unable to assign the total demand. This in part is due to the operation of M42 junction 6 and Stonebridge Island which were both shown in the future baseline to experience increasing queues and delays in 2026. The increased demand associated with Proposed Scheme results in a further deterioration in conditions particularly as these are two of the main junctions on the route into Birmingham Interchange. Junction performance is discussed in more detail below.

Junction performance 2026

M42 junction 6

8.4.287 Table 8-116 shows the flow and maximum queues at M42 junction 6 in the weekday AM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-117: M42 junction 6 AM peak hour queue lengths (metres) - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

M42 junction 6	AM peak (08:00-09:00)			
	2026 future baseline		2026 with Proposed Scheme (no mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue
M42 north off-slip	1774	88	1662	82
A45 Coventry Road east off-slip	1357	127	1450	122
National Motorcycle Museum*	n/a	n/a	n/a	n/a
M42 south off-slip	2328	143	2667	145
A45 Coventry Road west off-slip	1648	94	1558	91
south Way - Left Turn	464	45	350	54
south Way - Ahead		62		67

8.4.288 Table 8-118 shows the flow and maximum queues at M42 junction 6 in the weekday PM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-118: M42 junction 6 PM peak hour queue lengths (metres) - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

M42 junction 6	PM peak (17:00-18:00)			
	2012		2026	
	Flow (veh)	Max queue	Flow (veh)	Max queue
M42 north off-slip	1366	79	1742	485
A45 Coventry Road east off-slip	1529	91	2025	1156
National Motorcycle Museum*	n/a	n/a	n/a	n/a
M42 south off-slip	1365	51	1746	3076
A45 Coventry Road west off-slip	1725	123	2200	135
south Way - Left Turn	413	43	554	58
south Way - Ahead		48		68

8.4.289 Table 8-117 and Table 8-118 show that in the AM peak hour, the additional traffic demand associated with Birmingham Interchange station has minimal impact on the operation of M42 junction 6. In the PM peak hour, queues are forecast in the future baseline and these are shown to increase with Proposed Scheme. These in part explain the substantial increase in average delays on the network.

8.4.290 Table 8-119 considers the operation of M42 junction 6 in terms of average journey times/delays and junction throughput the weekday AM peak hour.

Table 8-119: M42 junction 6 AM peak hour average journey times (seconds) and throughput - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

M42 junction 6	**AM peak (08:00-09:00)**	
	2026 future baseline	**2026 with Proposed Scheme (no mitigation)**
junction throughput (vehicles)	7571	7687
Average travel time per vehicle (seconds)	92	82

8.4.291 Table 8-120 shows the operation of M42 junction 6 in terms of average journey times/delays and junction throughput the weekday PM peak hour.

Table 8-120: M42 junction 6 PM peak hour average journey times (seconds) and throughput - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

M42 junction 6	**PM peak (17:00-18:00)**	
	2026 future baseline	**2026 with Proposed Scheme (no mitigation)**
junction throughput (vehicles)	8267	7109
Average travel time per vehicle (seconds)	140	228

8.4.292 Table 8-119 and Table 8-120 show that average journey times through the junction are not forecast to substantially change in the AM peak hour. However, average journey times increase in the by around 63% in the PM peak hour. It is also noted that this is associated with a reduced junction throughput of 14%. This indicates that wider congestion on the network is impacting of the operation of M42 junction 6 resulting in increased journey times and reduced throughput.

M6 junction 4

8.4.293 Table 8-121 shows the flow and maximum queues at M6 junction 4 in the weekday AM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-121: M6 junction 4 AM peak hour queue lengths (metres) - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

M6 junction 4	**AM peak (08:00-09:00)**			
	2026 future baseline		**2026 with Proposed Scheme (no mitigation)**	
	Flow (veh)	**Max queue**	**Flow (veh)**	**Max queue**
A446 Stonebridge Road (north)	1200	382	1158	275
M6 east off-slip	699	136	673	1177
A446 Stonebridge Road (south)	1213	35	1006	30
M6 west off-slip	1401	161	1509	95

8.4.294 Table 8-122 below shows the flow and maximum queues at M6 junction 4 in the weekday PM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-122: M6 junction 4 PM peak hour queue lengths (metres) - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

M6 junction 4	**PM peak (17:00-18:00)**			
	2026 future baseline		**2026 with Proposed Scheme (no mitigation)**	
	Flow (veh)	**Max queue**	**Flow (veh)**	**Max queue**
A446 Stonebridge Road (north)	1192	73	1345	362
M6 east off-slip	504	66	360	51
A446 Stonebridge Road (south)	1843	105	1903	195
M6 west off-slip	1221	149	1291	830

8.4.295 Table 8-121 and Table 8-122 show that in the AM peak hour the additional traffic associated with Birmingham Interchange station is expected to substantially increase queues on the M6 east off-slip at the junction. This is as a result of the additional traffic from the M6 west passing this approach. It should be noted that the queue is forecast to extend to the M6 mainline.

8.4.296 In the PM peak hour, there is an increase in queue on the M6 west off-slip but the queue is contained on the slip without affecting the flow of the M6 mainline.

8.4.297 Table 8-123 considers the operation of M6 junction 4 in terms of average journey times/delays and junction throughput the weekday AM peak hour.

Table 8-123: M6 junction 4 AM peak hour average journey times (seconds) and throughput - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

M6 junction 4	**AM peak (08:00-09:00)**	
	2026 future baseline	**2026 with Proposed Scheme (no mitigation)**
junction Throughput (vehicles)	4513	4346
Average Travel Time per Vehicle (seconds)	45	43

8.4.298 Table 8-124 shows the operation of M6 junction 4 in terms of average journey times/delays and junction throughput the weekday PM peak hour.

Table 8-124: M6 junction 4 PM peak hour average journey times (seconds) and throughput - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

M6 junction 4	**PM peak (17:00-18:00)**	
	2026 future baseline	**2026 with Proposed Scheme (no mitigation)**
junction Throughput (vehicles)	4760	4898
Average Travel Time per Vehicle (seconds)	45	60

8.4.299 Table 8-123 and Table 8-124 above show that average journey times through the junction are forecast to be unaffected in the AM peak hour. However, throughput through the junction falls by increase by around 4% indicating wider congestion on the network affects the operation of the junction. In the PM peak hour, average journey times increase by around 33% and junction throughput increases by around 3%.

Stonebridge Island

8.4.300 Table 8-125 below shows the flow and maximum queues at Stonebridge Island in the weekday AM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-125: Stonebridge Island AM peak hour queue lengths (metres) - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

Stonebridge Island	**AM peak (08:00-09:00)**			
	2026 future baseline		**2026 with Proposed Scheme (no mitigation)**	
	Flow (veh)	**Max queue**	**Flow (veh)**	**Max queue**
A452 Chester Road	2080	330	2322	586
A45 east off-slip	272	102	256	134
A452 Kenilworth Road	1185	76	1356	163
A45 west off-slip - left turn	1409	154	1545	410
A45 west off-slip - ahead		175		396

8.4.301 Table 8-126 below shows the flow and maximum queues at Stonebridge Island in the weekday PM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-126: Stonebridge Island PM peak hour queue lengths (metres) - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

Stonebridge Island	**PM peak (17:00-18:00)**			
	2026 future baseline		**2026 with Proposed Scheme (no mitigation)**	
	Flow (veh)	**Max queue**	**Flow (veh)**	**Max queue**
A452 Chester Road	2308	317	2018	1765
A45 east off-slip	292	61	259	1348
A452 Kenilworth Road	1115	74	863	1801
A45 west off-slip - left turn	1183	147	1217	284
A45 west off-slip - ahead		142		279

8.4.302 Table 8-125 and Table 8-126 above show that in the AM peak hour the junction is expected to be able to accommodate the forecasts queues in 2026 in the available storage space although queues begin to develop particularly on the A45 off-slips. With the Proposed Scheme queues also develop on the A452 Chester Road but do not affect upstream junctions.

8.4.303 In the PM peak hour, queues are forecast to increase as a result of the Proposed Scheme particularly on the A452 Chester Road and A45 east off-slip. This increase is related to the demand for traffic leaving Proposed Scheme via Stonebridge Island to access the M42 and the A45 Coventry Road.

8.4.304 Table 8-127 below considers the operation of Stonebridge Island in terms of average journey times/delays and junction throughput the weekday AM peak hour.

Table 8-127: Stonebridge Island AM peak hour average journey times (seconds) and throughput - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

Stonebridge Island	**AM peak (08:00-09:00)**	
	2026 future baseline	**2026 with Proposed Scheme (no mitigation)**
junction Throughput (vehicles)	4946	5479
Average Travel Time per Vehicle (seconds)	56	74

8.4.305 Table 8-128 shows the operation of Stonebridge Island in terms of average journey times/delays and junction throughput the weekday PM peak hour.

Table 8-128: Stonebridge Island PM peak hour average journey times (seconds) and throughput - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

Stonebridge Island	**PM peak (17:00-18:00)**	
	2026 future baseline	**2026 with Proposed Scheme (no mitigation)**
junction Throughput (vehicles)	4897	4356
Average Travel Time per Vehicle (seconds)	49	116

8.4.306 Table 8-127 and Table 8-128 show that whilst average journey times through the junction are forecast to increase in the AM peak, junction throughput also increases by around 11%. The PM peak is seen to suffer an increase in junction travel time of over 137% and the throughput actually falls by around 11% indicating that the junction is unable to accommodate the demand in the PM peak resulting in increasing queues and delays.

A45 Coventry Road/Damson Parkway

8.4.307 Table 8-129 shows the flow and maximum queues at the A45 Coventry Road/Damson Parkway traffic signal junction in the weekday AM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-129: A45 Coventry Road/Damson Parkway AM peak hour queue lengths (metres) - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

A45 Coventry Road/Damson Parkway	AM peak (08:00-09:00)			
	2026 future baseline		2026 with Proposed Scheme (no mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue
Terminal Road - Left Turn	188	99	189	79
Terminal Road - Ahead/ Right Turn		101		74
A45 Coventry Road (east) - Ahead	2136	126	2150	136
A45 Coventry Road (east) - Right Turn		53		46
Damson Parkway - Left Turn	722	34	762	32
Damson Parkway - Ahead/Right Turn		280		615
A45 Coventry Road (west) - Ahead	1979	1001	1966	1003
A45 Coventry Road (west) - Right Turn		69		54

8.4.308 Table 8-130 shows the flow and maximum queues at in the weekday PM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-130: A45 Coventry Road/Damson Parkway PM peak hour queue lengths (metres) - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

A45 Coventry Road/Damson Parkway	PM peak (17:00-18:00)			
	2026 future baseline		2026 with Proposed Scheme (no mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue
Terminal Road - Left Turn	268	161	252	196
Terminal Road - Ahead/ Right Turn		163		198
A45 Coventry Road (east) - Ahead	2710	334	2390	419
A45 Coventry Road (east) - Right Turn		84		67
Damson Parkway - Left Turn	674	46	675	50
Damson Parkway - Ahead/Right Turn		644		646
A45 Coventry Road (west) - Ahead	2339	451	2310	1000
A45 Coventry Road (west) - Right Turn		159		382

8.4.309 Table 8-129 and Table 8-130 above show that in the AM peak hour queues are forecast to increase on Damson Parkway.

8.4.310 In the PM peak hour queues are forecast to increase on the A45 Coventry Road west approach to the junction and this likely to be associated with the demand for vehicles leaving the Proposed Scheme.

8.4.311 Table 8-131 below considers the operation of the A45 Coventry Road/Damson Parkway traffic signal junction in terms of average journey times/delays and junction throughput the weekday AM peak hour.

Table 8-131: A45 Coventry Road/Damson Parkway AM peak hour average journey times (seconds) and throughput - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

A45 Coventry Road/Damson Parkway	**AM peak (08:00-09:00)**	
	2026 future baseline	**2026 with Proposed Scheme (no mitigation)**
junction Throughput (vehicles)	5025	5066
Average Travel Time per Vehicle (seconds)	68	78

8.4.312 Table 8-132 below shows the operation of the A45 Coventry Road/Damson Parkway traffic signal junction in terms of average journey times/delays and junction throughput the weekday PM peak hour.

Table 8-132: A45 Coventry Road/Damson Parkway PM peak hour average journey times (seconds) and throughput - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

A45 Coventry Road/Damson Parkway	**PM peak (17:00-18:00)**	
	2026 future baseline	**2026 with Proposed Scheme (no mitigation)**
junction Throughput (vehicles)	5990	5627
Average Travel Time per Vehicle (seconds)	64	90

8.4.313 Table 8-131 and Table 8-132 above shows that average journey times are not expected to change substantially in the AM peak but do increase in the PM peak with a reduction in throughput. This is likely to be related to the fact that the network is operating at close to capacity.

A452 Chester Road/B4438 Bickenhill Parkway

8.4.314 Table 8-133 below shows the flow and maximum queues at the A452 Chester Road/B4438 Bickenhill Parkway roundabout junction (Birmingham Business Park) in the weekday AM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-133: A452 Chester Road/B4438 Bickenhill Parkway AM peak hour queue lengths (metres) - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

A452 Chester Road/B4438 Bickenhill Parkway	**AM peak (08:00-09:00)**			
	2026 future baseline		**2026 with Proposed Scheme (no mitigation)**	
	Flow (veh)	**Max queue**	**Flow (veh)**	**Max queue**
A446 north slips	955	105	n/a	n/a
A452 Chester Road south	768	188	n/a	n/a
B4438 Bickenhill Parkway	308	111	434	42

Solihull Parkway	136	10	136	15
A452 Chester Road north	1245	30	1166	0

8.4.315 Table 8-134 below shows the flow and maximum queues at in the weekday PM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-134: A452 Chester Road/B4438 Bickenhill Parkway PM peak hour queue lengths (metres) - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

A452 Chester Road/B4438 Bickenhill Parkway	**PM peak (17:00-18:00)**			
	2026 future baseline		**2026 with Proposed Scheme (no mitigation)**	
	Flow (veh)	**Max queue**	**Flow (veh)**	**Max queue**
A446 north slips	170	22	n/a	n/a
A452 Chester Road south	616	75	n/a	n/a
B4438 Bickenhill Parkway	442	24	414	11
Solihull Parkway	1479	184	1493	51
A452 Chester Road north	945	380	791	95

8.4.316 Table 8-133 and Table 8-134 above show the Proposed Scheme has no substantial impacts on the junction and actually addresses baseline forecast queues in both the AM and PM peak hours.

8.4.317 As noted above the existing roundabout junction is replaced by a series of three roundabout junctions and associated link roads. Table 8-135 and Table 8-136 summarise the queue results for the two further new junctions which are not included in the tables above.

Table 8-135: B4438 Bickenhill Parkway/Northway peak hour queue lengths (metres) - 2026 with Hs2 (no mitigation)

B4438 Bickenhill Parkway/Northway roundabout	**AM peak (08:00-09:00)**	**PM peak (17:00-18:00)**
	Max queue	**Max queue**
B4438 (north)	82	114
New Link from Interchange Roundabout	70	21
Northway	168	100
B4438 (south)	74	33

Table 8-136: New Proposed Scheme Birmingham Interchange Access/A446 Links/A452 links peak hour queue lengths (metres) - 2026 with Hs2 (no mitigation)

Proposed Scheme Birmingham Interchange Access roundabout	**AM Peak (08:00-09:00)**	**PM Peak (17:00-18:00)**
	Max queue	**Max queue**
A446 Link Road (north)	46	9
A452 Link Road (south)	35	0
Proposed Scheme Egress 1	6	0
Proposed Scheme Egress 2	2	2
A452 Link Road (north)	16	8

8.4.318 Table 8-135 and Table 8-136 above show that the new roundabout junctions operate with little or no queues.

8.4.319 Table 8-137 below considers the operation of the network of three junctions compared with the existing A452 Chester Road/B4438 Bickenhill Parkway roundabout junction in terms of average journey times/delays and junction throughput the weekday AM peak hour.

Table 8-137: A452 Chester Road/B4438 Bickenhill Parkway AM peak hour average journey times (seconds) and throughput - 2012, 2026, 2041 future baseline (no Proposed Scheme)

A452 Chester Road/B4438 Bickenhill Parkway	**AM peak (08:00-09:00)**	
	2026 future baseline	**2026 with Proposed Scheme (no mitigation)**
junction Throughput (vehicles)	3854	4269
Average Travel Time per Vehicle (seconds)	71	106

8.4.320 Table 8-138 below shows the operation of the network of three junctions compared with the existing A452 Chester Road/B4438 Bickenhill Parkway roundabout junction in terms of average journey times/delays and junction throughput the weekday PM peak hour.

Table 8-138: A452 Chester Road/B4438 Bickenhill Parkway PM peak hour average journey times (seconds) and throughput - 2012, 2026, 2041 future baseline (no Proposed Scheme)

A452 Chester Road/B4438 Bickenhill Parkway	**PM peak (17:00-18:00)**	
	2026 future baseline	**2026 with Proposed Scheme (no mitigation)**
junction Throughput (vehicles)	3973	4085
Average Travel Time per Vehicle (seconds)	78	74

8.4.321 Table 8-137 and Table 8-138 above show that average journey times through the series of junctions increase in the AM. This is due to the new configuration of three roundabouts and associated links roads replacing a single roundabout which result in longer travel distances. The average travel times in the PM peak are largely unchanged.

A45 Coventry Road/B4438 Catherine-de-Barnes Lane

8.4.322 Table 8-139 below shows the flow and maximum queues at the A45 Coventry Road/B4438 Catherine-de-Barnes Lane roundabout junction in the weekday AM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-139: A45 Coventry Road/B4438 Catherine-de-Barnes Lane AM peak hour queue lengths (metres) - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

A45 Coventry Road/B4438 Catherine-de-Barnes Lane	AM peak (08:00-09:00)			
	2026 future baseline		2026 with Proposed Scheme (no mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue
B4438 Bickenhill Lane	997	32	1053	35
A45 east off-slip	2607	65	2824	118
B4438 Catherine De Barnes	715	50	719	47
A45 west off-slip	1653	15	2057	60

8.4.323 Table 8-140 below shows the flow and maximum queues at in the weekday PM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-140: A45 Coventry Road/B4438 Catherine-de-Barnes Lane PM peak hour queue lengths (metres) - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

A45 Coventry Road/B4438 Catherine-de-Barnes Lane	PM peak (17:00-18:00)			
	2026 future baseline		2026 with Proposed Scheme (no mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue
B4438 Bickenhill Lane	2080	14	1928	0
A45 east off-slip	2425	163	2028	462
B4438 Catherine De Barnes	546	67	559	0
A45 west off-slip	1937	43	1914	0

8.4.324 Table 8-139 and Table 8-140 above show that in the AM peak hour the Proposed Scheme has minimal impact on the performance of the junction. Some of the maximum queues increase albeit all queues are contained within slip roads and/or without blocking upstream junctions.

8.4.325 In the PM peak hour queues increase on the A45 east off-slip however these are contained within the length of the off-slip. These queues are likely to be as a result of traffic re-routing due to wider network constraints as the Proposed Scheme adds minimal flows from this direction.

8.4.326 Table 8-141 below considers the operation of the A45 Coventry Road/B4438 Catherine-de-Barnes Lane roundabout junction in terms of average journey times/delays and junction throughput the weekday AM peak hour.

Table 8-141: A45 Coventry Road/B4438 Catherine-de-Barnes Lane AM peak hour average journey times (seconds) and throughput - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

A45 Coventry Road/B4438 Catherine-de-Barnes Lane	**AM peak**	
	2026 future baseline	**2026 with Proposed Scheme (no mitigation)**
junction Throughput (vehicles)	5972	6654
Average Travel Time per Vehicle (seconds)	23	24

8.4.327 Table 8-142 below shows the operation of the A452 Chester Road/B4438 Bickenhill Parkway roundabout junction in terms of average journey times/delays and junction throughput the weekday PM peak hour.

Table 8-142: A45 Coventry Road/B4438 Catherine-de-Barnes Lane PM peak hour average journey times (seconds) and throughput - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

A45 Coventry Road/B4438 Catherine-de-Barnes Lane	**PM peak**	
	2026 future baseline	**2026 with Proposed Scheme (no mitigation)**
junction Throughput (vehicles)	6988	6428
Average Travel Time per Vehicle (seconds)	22	42

8.4.328 Table 8-141 and Table 8-142 above show that there in minimal change average journey times through the junction in the AM peak hour. The junction sees a 91% increase in journey times through the junction in the PM peak hour however this against a very low future baseline journey time. The change in journey time is therefore not expected to be substantial.

A452 Chester Road/Coleshill Heath Road roundabout

8.4.329 Table 8-143 below shows the flow and maximum queues at the A452 Chester Road/Coleshill Heath Road roundabout in the weekday AM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-143: A452 Chester Road/Coleshill Heath Road roundabout AM peak hour queue lengths (metres) - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

A452 Chester Road/Coleshill Heath Road	AM peak (08:00-09:00)			
	2026 future baseline		2026 with Proposed Scheme (no mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue
Coleshill Heath Road (north)	407	421	687	1323
Chester Road (east)	777	75	640	43
Coleshill Heath Road (south)	530	77	680	161
Chester Road (west)	1371	377	1069	1299

8.4.330 Table 8-144 below shows the flow and maximum queues at in the weekday PM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-144: A452 Chester Road/Coleshill Heath Road PM peak hour queue lengths (metres) - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

A452 Chester Road/Coleshill Heath Road	PM peak (17:00-18:00)			
	2026 future baseline		2026 with Proposed Scheme (no mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue
Coleshill Heath Road (north)	787	217	951	645
A452 Chester Road (east)	1439	149	1160	767
Coleshill Heath Road (south)	328	122	484	384
A452 Chester Road (west)	872	74	904	28

8.4.331 Table 8-143 and Table 8-144 above show that queues are forecast to increase in both the AM and PM peak hours. It should be noted that the demand to/from Birmingham Interchange station from this area is not expected to be substantial. In 2026, the demand from the north Solihull areas and beyond via the A452 Chester Road equates to less than one vehicle per minute. The increase in queues is related to traffic re-routing due to wider network congestion and existing A452 Chester Road/B4438 Bickenhill Parkway roundabout to accommodate the Proposed Scheme. This results in some traffic rerouting via Coleshill Heath Road and thereby having an impact on the A452 Chester Road/Coleshill Heath Road roundabout.

8.4.332 Table 8-145 below considers the operation of A452 Chester Road/Coleshill Heath Road roundabout junction in terms of average journey times/delays and junction throughput the weekday AM peak hour.

Table 8-145: A452 Chester Road/Coleshill Heath Road AM peak hour average journey times (seconds) and throughput - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

A452 Chester Road/Coleshill Heath Road	AM peak (08:00-09:00)	
	2026 future baseline	2026 with Proposed Scheme (no mitigation)
junction Throughput (vehicles)	3085	3076
Average Travel Time per Vehicle (seconds)	63	164

8.4.333 Table 8-146 below shows the operation of the A452 Chester Road/Coleshill Heath Road roundabout junction in terms of average journey times/delays and junction throughput the weekday PM peak hour.

Table 8-146: A452 Chester Road/Coleshill Heath Road PM peak hour average journey times (seconds) and throughput - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

A452 Chester Road/Coleshill Heath Road	PM peak (17:00-18:00)	
	2026 future baseline	2026 with Proposed Scheme (no mitigation)
junction Throughput (vehicles)	3425	3499
Average Travel Time per Vehicle (seconds)	39	61

8.4.334 Table 8-145 and Table 8-146 above shows that average journey times through the junction increase substantially in the AM peak hour but are not so substantial in the PM peak hour.

Route travel times 2026

M42 junction 6-J7

8.4.335 Table 8-147 below summarises the change in journey times on the M42 in the weekday AM peak hour for 2026 future baseline and with Proposed Scheme (no mitigation). Results have been extracted from the validated and future years VISSIM models.

Table 8-147: M42 travel time AM peak hour (seconds) - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

AM peak (08:00-09:00)	2026 future baseline	2026 with Proposed Scheme (no mitigation)
northbound	299	318
southbound	321	332

8.4.336 Table 8-148 below summarises the change in journey times on the M42 in the weekday PM peak hour for 2026 future baseline and with Proposed Scheme (no mitigation). Results have been extracted from the validated and future years VISSIM models.

Table 8-148: M42 travel time PM peak hour (seconds) - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

PM peak (17:00-18:00)	2026 future baseline	2026 with Proposed Scheme (no mitigation)
northbound	353	395
southbound	311	420

8.4.337 Table 8-147 and Table 8-148 above show that the Proposed Scheme has minimal impact on travel times on the M42 in the AM peak hour. The impact in the PM peak hour is more substantial particularly in the southbound direction. This is expected to be related to the queues at Stonebridge Island and M42 junction 6 which have a knock-on impact on the operation of the motorway mainline.

A45 Coventry Road between Goodway Road and Shepherds Lane

8.4.338 Table 8-149 below summarises the change in journey times on the A45 Coventry Road in the weekday AM peak hour for 2026 future baseline and with Proposed Scheme (no mitigation). Results have been extracted from the validated and future years VISSIM models.

Table 8-149: A45 Coventry Road travel time AM peak hour (seconds) - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

AM peak (08:00-09:00)	2026 future baseline	2026 with Proposed Scheme (no mitigation)
eastbound	483	486
westbound	371	373

8.4.339 Table 8-150 below summarises the change in journey times on the A45 Coventry Road in the weekday PM peak hour for 2026 future baseline and with Proposed Scheme (no mitigation). Results have been extracted from the validated and future years VISSIM models.

Table 8-150: A45 Coventry Road travel time PM peak hour (seconds) - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

PM peak (17:00-18:00)	2026 future baseline	2026 with Proposed Scheme (no mitigation)
eastbound	357	518
westbound	407	862

8.4.340 Table 8-149 and Table 8-150 above show a similar picture for the A45 Coventry Road as is seen for the M42. The Proposed Scheme has minimal impact on travel times in the AM peak hour but a much more in the PM peak hour. This is again expected to be related to the substantial queues at Stonebridge Island and M42 junction 6.

A446 between Stonebridge Island and A446 Stonebridge Road/B4117 Coventry Road junction

8.4.341 Table 8-151 below summarises the change in journey times on the A446 in the weekday AM peak hour for 2026 future baseline and with Proposed Scheme (no mitigation). Results have been extracted from the validated and future years VISSIM models.

Table 8-151: A446 Stonebridge Road travel time AM peak hour (seconds) - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

AM peak (08:00-09:00)	2026 future baseline	2026 with Proposed Scheme (no mitigation)
northbound	225	230
southbound	459	376

8.4.342 Table 8-152 below summarises the change in journey times on the A446 in the weekday PM peak hour for 2026 future baseline and with Proposed Scheme (no mitigation). Results have been extracted from the validated and future years VISSIM models.

Table 8-152: A446 travel time PM peak hour (seconds) - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

PM peak (17:00-18:00)	2026 future baseline	2026 with Proposed Scheme (no mitigation)
northbound	227	237
southbound	247	402

8.4.343 Table 8-151 and Table 8-152 above show a similar picture for the A446 Stonebridge Road. The AM peak sees a slight improvement in travel times but the PM peak an increase in travel times in the southbound direction which is likely to be related to traffic leaving Birmingham Interchange station impacting on Stonebridge Island.

A452 between Cornet's End Roundabout and A452 Chester Road/Coleshill Heath Road Roundabout

8.4.344 Table 8-153 below summarises the change in journey times on the A452 in the weekday AM peak hour for 2012, 2026 and 2041. Results have been extracted from the validated and future years VISSIM models.

Table 8-153: A452 travel time AM peak hour (seconds) - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

AM peak (08:00-09:00)	2026 future baseline	2026 with Proposed Scheme (no mitigation)
northbound	325	382
southbound	348	396

8.4.345 Table 8-154 below summarises the change in journey times on the A452 in the weekday PM peak hour for 2026 future baseline and with Proposed Scheme (no mitigation). Results have been extracted from the validated and future years VISSIM models.

Table 8-154: A452 travel time PM peak hour (seconds) - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

PM peak (17:00-18:00)	2026 future baseline	2026 with Proposed Scheme (no mitigation)
northbound	304	471
southbound	380	468

8.4.346 Table 8-153 and Table 8-154 above show a similar picture for the A452 Chester Road. The AM peak sees no substantial change in travel times but travel times are increased in the PM peak as a result of wider congestion and vehicles rerouting.

Strategic and local road network traffic flows 2041 Phase Two

8.4.347 This section summarises the increases in traffic on the strategic road network in 2041 as a result of the Proposed Scheme, together with the assessment of the impacts. Table 8-155 below shows a summary of the 2041 future baseline flows together with the 2026 Proposed Scheme flows on completion of the Proposed Scheme in the AM peak hour.

Table 8-155: Strategic road network AM peak hour traffic flows 2041 future baseline and with Proposed Scheme traffic (vehicles)

Location	Dir	AM peak (08:00-09:00)							
		2041 baseline (veh)		2041 baseline with Proposed Scheme traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With Proposed Scheme
A446 (Stonebridge Road) between M6 junction 4 and slips to A452	NB	1221	75	1304	75	6.8%	0.00%	33.9%	36.2%
	SB	2157	133	2477	133	14.8%	0.00%	59.9%	68.8%
A446 north of A452 slips	NB	1225	76	1225	76	0.1%	0.00%	68.0%	68.1%
A452 Between Packington Lane and Stonebridge Island	NB	2124	131	3562	131	67.7%	0.00%	59.0%	68.5%
	SB	2283	141	2644	141	15.8%	0.00%	63.4%	50.8%
A45 east of Stonebridge Island	EB	1877	116	1933	116	3.0%	0.00%	52.1%	53.7%
	WB	2731	169	2947	169	7.9%	0.00%	75.9%	81.9%
A45 between M42 junction 6 and Stonebridge Island	EB	2548	157	3545	157	39.2%	0.00%	45.5%	63.3%
	WB	3184	197	3434	197	7.9%	0.00%	56.8%	61.3%
M42 south of junction 6	NB	5604	326	6261	326	11.7%	0.00%	77.8%	87.0%
	SB	5914	344	6083	344	2.9%	0.00%	82.1%	84.5%
M42 north of junction 6	NB	4489	261	4496	261	0.2%	0.00%	62.3%	62.4%
	SB	6320	367	6347	367	0.4%	0.00%	87.8%	88.1%
A452 (Chester Road) between Birmingham Business Park Roundabout and Coleshill Heath Road	SEB	1806	111	1898	111	5.1%	0.00%	113.6%	119.4%
	NWB	694	43	718	43	3.5%	0.00%	43.7%	45.2%
M42 junction 6 northbound off slip	NB	2333	136	2989	136	28.1%	0.00%	129.6%	166.1%

Location	Dir	AM peak (08:00-09:00)							
		2041 baseline (veh)		2041 baseline with Proposed Scheme traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With Proposed Scheme
A45 west of Damson Parkway	EB	2270	140	2441	140	7.6%	0.00%	63.1%	67.8%
	WB	1951	120	1996	120	2.3%	0.00%	54.2%	55.5%
A45 between Damson Parkway an Clock junction	EB	2330	144	2644	144	13.5%	0.00%	64.7%	73.5%
	WB	2289	141	2371	141	3.6%	0.00%	63.6%	65.8%
A45 between Clock junction and M42 junction 6	EB	2155	133	2470	133	14.6%	0.00%	38.5%	44.1%
	WB	3470	214	3552	214	2.4%	0.00%	62.0%	63.4%
Link from M42 northbound to M6 northbound	NB	1126	65	1127	65	0.1%	0.0%	56.3%	56.4%
M42 north of link road to M6 eastbound	NB	2717	158	2723	158	0.2%	0.0%	48.5%	48.6%
	SB	4948	288	4975	288	0.6%	0.0%	88.3%	88.8%
M6 west of junction 4	SB	2967	172	3171	172	6.9%	0.0%	53.0%	56.6%
	NB	3621	210	3677	210	1.6%	0.0%	64.7%	65.7%
M6 east of junction 4	EB	3340	194	3356	194	0.5%	0.0%	59.6%	59.9%
	WB	3781	220	3843	220	1.6%	0.0%	67.5%	68.6%
M6 south bound off slip at junction 4	SB	1040	60	1243	60	19.5%	0.0%	57.8%	69.1%
M6 junction 4 on slip	EB	462	27	477	27	3.3%	0.0%	25.6%	26.5%
	WB	492	29	544	29	10.6%	0.0%	27.3%	30.2%
M6 junction WB traffic approaching roundabout	WB	638	37	697	37	9.3%	0.0%	22.8%	24.9%
A452 (Kenilworth Road) south of Stonebridge Island	NB	1226	76	1455	76	18.7%	0.0%	34.1%	40.4%
	SB	1455	90	1513	90	4.0%	0.0%	40.4%	42.0%
A446 Slips from Birmingham Business Park Roundabout	EB	148	9	230	9	55.4%	0.0%	8.8%	13.7%
	WB	784	48	1104	48	40.8%	0.0%	46.8%	65.9%
A446 between Coleshill Heath Road and M6 junction 4	SB	1416	87	1474	87	4.1%	0.0%	39.3%	32.8%
	NB	1408	87	1423	87	1.1%	0.0%	39.1%	31.6%

Location	Dir	AM peak (08:00-09:00)							
		2041 baseline (veh)		2041 baseline with Proposed Scheme traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With Proposed Scheme
A446 between Coleshill Heath Road and Coventry Road	NB	1520	94	1535	94	1.0%	0.0%	42.2%	42.6%
	SB	1834	113	1892	113	3.2%	0.0%	51.0%	52.6%
Chester Road west of Coleshill Heath Road	EB	1776	110	1868	110	5.2%	0.0%	55.5%	58.4%
	WB	1275	79	1299	79	1.9%	0.0%	39.8%	40.6%

8.4.348 Table 8-155 above clearly shows the impact the Proposed Scheme will have on the strategic network. The most substantial impacts are on roads closest to Birmingham Interchange station and on the route to and from the M42 south.

8.4.349 The impact of these increases on the operation of the network is considered in greater detail below using the VISSIM model.

8.4.350 Table 8-156 below shows a summary of the 2041 future baseline flows together with the 2041 Proposed Scheme flows on completion of the Proposed Scheme in the PM peak hour.

Table 8-156: Strategic road network PM peak hour traffic flows 2041 future baseline and with Proposed Scheme Traffic (vehicles)

Location	Dir	PM peak (17:00-18:00)							
		2041 baseline (veh)		2041 baseline with Proposed Scheme traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With Proposed Scheme
A446 (Stonebridge Road) between M6 junction 4 and slips to A452	NB	2094	97	2400	97	14.6%	0.0%	58.2%	66.7%
	SB	1778	83	1808	83	1.7%	0.0%	49.4%	50.2%
A452 (Chester Road) between Birmingham Business Park Roundabout and Melbicks	SB	1196	56	0	0	-100.0%	-100.0%	33.2%	0.0%
	NB	624	29	0	0	-100.0%	-100.0%	17.3%	0.0%
A446 north of A452 slips	NB	1399	65	1399	65	0.0%	0.0%	77.7%	77.7%
	SB	1577	73	1578	73	0.0%	0.0%	87.6%	87.7%

Location	Dir	PM peak (17:00-18:00)							
		2041 baseline (veh)		2041 baseline with Proposed Scheme traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With Proposed Scheme
A452 Between Packington Lane and Stonebridge Island	NB	1943	90	2076	90	6.8%	0.0%	54.0%	39.9%
	SB	2795	130	4136	130	48.0%	0.0%	77.6%	79.5%
A45 east of Stonebridge Island	EB	2857	133	3062	133	7.2%	0.0%	79.4%	85.1%
	WB	2902	135	2924	135	0.7%	0.0%	80.6%	81.2%
A45 between M42 junction 6 and Stonebridge Island	EB	3030	141	3124	141	3.1%	0.0%	54.1%	55.8%
	WB	3758	175	4681	175	24.5%	0.0%	67.1%	83.6%
M42 south of junction 6	NB	6024	283	6085	283	1.0%	0.0%	83.7%	84.5%
	SB	6314	297	6940	297	9.9%	0.0%	87.7%	96.4%
M42 north of junction 6	NB	6268	295	6294	295	0.4%	0.0%	87.1%	87.4%
	SB	5614	264	5617	264	0.1%	0.0%	78.0%	78.0%
A452 (Chester Road) between Birmingham Business Park Roundabout and Coleshill Heath Road	SEB	837	39	845	39	1.0%	0.0%	52.6%	53.1%
	NWB	1491	69	1578	69	5.8%	0.0%	93.8%	99.3%
M42 junction 6 northbound off slip	NB	1557	73	1618	73	3.9%	0.0%	86.5%	89.9%
M42 junction 6 southbound on slip	SB	2060	97	2060	97	0.0%	0.0%	114.4%	114.4%
A45 west of Damson Parkway	EB	2503	116	2522	116	0.8%	0.0%	69.5%	70.1%
	WB	2680	125	2844	125	6.1%	0.0%	74.5%	79.0%
A45 between Damson Parkway an Clock junction	EB	2538	118	2569	118	1.2%	0.0%	70.5%	71.4%
	WB	3111	145	3410	145	9.6%	0.0%	86.4%	94.7%
A45 between Clock junction and M42 junction 6	EB	3823	178	3854	178	0.8%	0.0%	68.3%	68.8%
	WB	3647	169	3946	169	8.2%	0.0%	65.1%	70.5%
Link from M42 northbound to M6 northbound	NB	1291	61	1291	61	0.0%	0.0%	64.6%	64.6%
Link from M42 northbound to M6 eastbound	-	944	44	944	44	0.0%	0.0%	94.4%	94.4%
Link between M6 westbound and M42 southbound	WB	820	39	820	39	0.0%	0.0%	41.0%	41.0%
M42 north of link road to M6 eastbound	NB	4175	196	4201	196	0.6%	0.0%	74.5%	75.0%
M42 north of link road to M6 eastbound	SB	4685	220	4688	220	0.1%	0.0%	83.7%	83.7%

Location	Dir	PM peak (17:00-18:00)							
		2041 baseline (veh)		2041 baseline with Proposed Scheme traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With Proposed Scheme
M6 west of junction 4	SB	3366	158	3389	158	0.7%	0.0%	60.1%	60.5%
	NB	3967	187	4161	187	4.9%	0.0%	70.8%	74.3%
M6 east of junction 4	EB	3975	187	4034	187	1.5%	0.0%	71.0%	72.0%
	WB	3533	166	3539	166	0.2%	0.0%	63.1%	63.2%
M6 south bound off slip at junction 4	SB	893	42	914	42	2.3%	0.0%	49.6%	50.8%
M6 junction 4 on slip	EB	797	38	854	38	7.2%	0.0%	44.3%	47.5%
M6 junction 4 on slip	WB	753	35	946	35	25.6%	0.0%	41.8%	52.6%
M6 junction WB traffic approaching roundabout	WB	436	21	441	21	1.1%	0.0%	15.6%	15.7%
M6 junction 4 through junction traffic	WB	2277	107	2277	107	0.0%	0.0%	81.3%	81.3%
A452 (Kenilworth Road) south of Stonebridge Island	NB	1389	65	1410	65	1.5%	0.0%	38.6%	39.2%
	SB	1657	77	1874	77	13.1%	0.0%	46.0%	52.1%
A452 (Chester Road) north of junction with A446	NB	624	29	624	29	0.0%	0.0%	17.3%	17.3%
	SB	1154	54	1154	54	0.0%	0.0%	32.0%	32.0%
A446 Slips from Birmingham Business Park Roundabout	EB	730	34	1036	34	41.9%	0.0%	43.6%	61.8%
	WB	200	9	230	9	15.0%	0.0%	12.0%	13.8%
A446 between Coleshill Heath Road and M6 junction 4	SB	1323	61	1328	61	0.4%	0.0%	36.8%	29.5%
	NB	2091	97	2147	97	2.7%	0.0%	58.1%	47.7%
A446 between Coleshill Heath Road and Coventry Road	NB	2043	95	2099	95	2.7%	0.0%	56.7%	58.3%
	SB	1468	68	1473	68	0.3%	0.0%	40.8%	40.9%
Chester Road west of Coleshill Heath Road	EB	969	45	977	45	0.8%	0.0%	30.3%	30.5%
	WB	1840	85	1927	85	4.7%	0.0%	57.5%	60.2%

8.4.351 Table 8-156 above shows that there are a number of locations where the v/c ratios are exceeding 85% indicating that the network is approaching or at capacity. The most substantial impacts are again on roads closest to Birmingham Interchange station and on the route to and from the M42 south.

8.4.352 The impact of these increases on the operation of the network is considered in greater detail below using the VISSIM model.

8.4.353 This section summarises the increases in traffic on local roads in the area in 2041 as a result of the Proposed Scheme, together with the assessment of the impacts.

8.4.354 Table 8-157 below shows a summary of the 2041 future baseline flows for the local roads on which there is an impact forecast together with the 2041 Proposed Scheme flows on completion of the Proposed Scheme in the AM peak hour.

Table 8-157: Local road network AM peak hour traffic flows 2041 future baseline and with Proposed Scheme traffic (vehicles)

Location	Dir	AM peak (08:00-09:00)							
		2041 baseline (veh)		2041 baseline with Proposed Scheme traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With Proposed Scheme
south Way between M42 junction 6 and Pendigo Way	SB	206	6	212	6	2.9%	0.0%	6.5%	6.6%
Northway between north Avenue and north Car Park roundabout	SB	283	9	289	9	2.1%	0.0%	12.3%	12.6%
B4438 between Northway and Birmingham Business Park Roundabout	NB	881	27	3589	27	307.3%	0.0%	27.5%	112.2%
Damson Parkway	NB	913	28	1056	28	15.7%	0.0%	69.1%	80.0%
	SB	750	23	786	23	4.8%	0.0%	56.8%	59.5%

8.4.355 Table 8-56 above clearly shows that traffic will not create any capacity related issues on local routes within the area. The most substantial increase is on the B4438 Bickenhill Parkway which sees a 307% increase in traffic. This increase is largely related to the reconfiguration of highways to accommodate the Proposed Scheme.

8.4.356 The impact of these increases on the operation of the network is considered in greater detail below using the VISSIM model.

8.4.357 Table 8-159 below shows a summary of the 2041 future baseline flows for the local roads on which there is an impact forecast together with the 2041 Proposed Scheme flows on completion of the Proposed Scheme in the PM peak hour.

Table 8-158: Local road network PM peak hour traffic flows 2041 future baseline and with Proposed Scheme traffic (vehicles)

Location	Dir	PM peak (17:00-18:00)							
		2041 baseline (veh)		2041 baseline with Proposed Scheme traffic		Percentage impact		V/C ratio	
		veh	HGV	veh	HGV	veh	HGV	Baseline	With Proposed Scheme
south Way between M42 junction 6 and Pendigo Way	SB	346	7	372	7	7.5%	0.0%	10.8%	11.6%
Northway between north Avenue and north Car Park roundabout	SB	153	3	179	3	17.0%	0.0%	6.6%	7.8%
B4438 between Northway and Birmingham Business Park Roundabout	NB	785	17	1252	17	59.4%	0.0%	24.5%	39.1%
Damson Parkway	NB	890	27	902	27	1.3%	0.0%	67.4%	68.3%
	SB	789	24	924	24	17.1%	0.0%	59.8%	70.0%

8.4.358 Table 8-158 above clearly shows that traffic will not create any capacity related issues on local routes within the area. As with the AM peak, the most substantial increase is on B4438 Bickenhill Parkway which sees a 59.4% increase in traffic but which still operates well within capacity.

8.4.359 The largest increases (greater than 10%) in peak hour traffic flows on the strategic and local in 2041 on the road network local to Birmingham Interchange station as a result of the Proposed Scheme are:

- M42 junction 6 northbound off-slip where the demand in traffic flows will increase in 2041 by approximately 28% in the AM peak hour;
- M6 junction 4 westbound on-slip where traffic flows will increase in 2041 by approximately 11% in the AM peak hour and by approximately 26% in the PM peak hour;
- A45 Coventry Road, between Clock Island and Stonebridge Island where traffic flows will increase in 2041 by up to approximately 22% and 15% in the AM and PM peak hour respectively;
- A45 Coventry Road eastbound on-slip and westbound off-slip at M42 junction 6 where traffic flows will increase in 2041 by between approximately 12% and 39% in the AM peak hour and by up to approximately 32% in the PM peak hour;
- A45 Coventry Road eastbound and westbound on/off-slips at Stonebridge Island where the traffic flows will increase in 2041 by between approximately 22% and 72% in the AM peak hour, and 22% and 63% in the PM peak hour respectively;
- A446 Stonebridge Road, between M6 junction 4 and the merge with the A452 Chester Road where traffic flows will increase in 2041 by up to approximately

43% in the AM peak hour and and 36% in the PM peak hour;

- A452 Chester Road Between Packington Lane and Stonebridge Island where traffic flows will increase in 2041 by approximately 41% in the AM peak hour and by approximately 31% in the PM peak hour;
- B4438 Bickenhill Parkway, between Northway and the new A452 Chester Road/Solihull Parkway roundabout where traffic flows will increase in 2026 by approximately 161% in the AM peak hour and by approximately 105% in the PM peak hour primarily due to the reconfiguration of the road network;
- Northway, between the North Car Park Roundabout and Bickenhill Parkway where traffic flows will increase in 2041 by approximately 25% in the AM peak hour and by approximately 26% in the PM peak hour; and
- Damson Parkway - traffic flows will increase in 2041 by approximately 11% in the AM peak hour.

Network Modelling 2041

8.4.360 This section considers the impact of traffic generated by the Proposed Scheme in the area on the highway network. The Birmingham Interchange VISSIM model, described earlier in the report has been used to assess the changes in network conditions as a result of trips to and from Birmingham Interchange station.

Network Performance

8.4.361 Table 8-159 summarises the performance of the network in 2041 without the Proposed Scheme (future baseline) and with Proposed Scheme but not including any highway mitigation to address the additional trips for the AM peak hour.

Table 8-159: Birmingham Interchange area VISSIM model 2026 AM peak hour network performance indicators - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

Parameter	AM peak (08:00-09:00)	
	Future baseline	Proposed Scheme (no mitigation)
Average delay time per vehicle [s], All Vehicle Types	144.0	275.4
Average number of stops per vehicles, All Vehicle Types	3	8
Average speed [mph], All Vehicle Types	31.2	23.4
Average stopped delay per vehicle [s], All Vehicle Types	25	71
Total delay time [h], All Vehicle Types	1576	3061
Total Distance Travelled [km], All Vehicle Types	226483	224614
Number of Stops, All Vehicle Types	122700	327707
Number of vehicles in the network, All Vehicle Types	4977	7389
Number of vehicles that have left the network, All Vehicle Types	34421	32623
Total stopped delay [h], All Vehicle Types	278	784

Parameter	AM peak (08:00-09:00)	
	Future baseline	Proposed Scheme (no mitigation)
Total travel time [h], All Vehicle Types	4513	5972
Unreleased Vehicles	1921	5560

8.4.362 Table 8-159 shows that without mitigation average delays as a result of the Proposed Scheme are expected to increase in 2041 by 91% and average vehicle speeds fall by 7.8mph to 23.4mph as a result of additional traffic generated by Proposed Scheme. A further consequence of the increased demand is that the number of unreleased vehicles increases from 4.9% in the future baseline to 13.9% with Proposed Scheme (no mitigation). Table 8-160 summarises the locations at which vehicles are unreleased in 2041 future baseline and with Proposed Scheme (no mitigation) scenarios in the AM peak hour.

Table 8-160: Birmingham Interchange area VISSIM model AM peak hour unreleased vehicles - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

	2041 future baseline		2041 with Proposed Scheme (no mitigation)	
AM peak (08:00-09:00)	Unreleased vehicles	Proportion of demand	Unreleased vehicles	Proportion of demand
A45 Coventry Rd west of Damson Parkway (EB)	617	23.9%	849	30.9%
M6 east	609	12.9%	775	16.2%
Stonebridge Rd north (SB)	69	4.1%	225	12.8%
Chester Road north (SB)	20	1.3%	523	31.4%
Chelmsley Road		0.0%		
M42 north (SB)	610	9.1%	1829	27.1%
Damson Parkway			131	14.4%
Catherine De Barnes Lane			1	0.1%
M42 south (NB)			1172	16.0%
M6 west			141	3.5%

8.4.363 Table 8-160 shows that without mitigation in the AM peak hour there are a number of vehicles on key routes that are unable to enter the network. This is arising due to a combination of future baseline congestion and key junctions such and M42 junction 6, M6 junction 4 and Stonebridge Island being at or over capacity.

8.4.364 Table 8-162 summarises the performance of the network for the PM peak hour.

Table 8-161: Birmingham Interchange area VISSIM model PM peak hour network performance indicators - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

Parameter	PM peak (17:00-18:00)	
	Future baseline	Proposed Scheme (no mitigation)
Average delay time per vehicle [s], All Vehicle Types	162.3	470.8
Average number of stops per vehicles, All Vehicle Types	4.5	14.0
Average speed [mph], All Vehicle Types	30.4	15.7
Average stopped delay per vehicle [s], All Vehicle Types	37	229
Total delay time [h], All Vehicle Types	1955	5486
Total Distance Travelled [km], All Vehicle Types	251987	202234
Number of Stops, All Vehicle Types	195243	586993
Number of vehicles in the network, All Vehicle Types	5880	11909
Number of vehicles that have left the network, All Vehicle Types	37483	30447
Total stopped delay [h], All Vehicle Types	449	2652
Total travel time [h], All Vehicle Types	5158	8088
Unreleased Vehicles	3422	9442

8.4.365 Table 8-161 shows that without mitigation average delays as a result of the Proposed Scheme are expected to increase in 2041 by 190% and average vehicle speeds reduce by 14.7mph to 15.7mph in PM peak hour. These changes arise as a result of the increased demand for travel through the network generated by Proposed Scheme. The table above that the number of unreleased vehicles increases from 7.9% in the future baseline to 22.3% with Proposed Scheme (no mitigation). The Table 8-162 summarises the locations at which vehicles are unreleased in 2026 future baseline and with Proposed Scheme (no mitigation) scenarios in the PM peak hour.

Table 8-162: Birmingham Interchange area VISSIM model PM peak hour unreleased vehicles - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

	2041 future baseline		2041 with Proposed Scheme (no mitigation)	
PM peak (17:00-18:00)	Unreleased vehicles	Proportion of demand	Unreleased vehicles	Proportion of demand
A45 Coventry Rd west of Damson Parkway (EB)	159	6.0%	318	11.9%
Damson Parkway	183	21.8%	245	28.9%
Terminal Road	18	5.2%	25	7.4%
M42 south (NB)	1698	22.7%	2184	29.0%
A452 Kenilworth Road (NB)	1	0.1%	365	28.2%
A45 Birmingham Rd east (WB)	298	9.6%	828	26.4%
Solihull Parkway	172	9.9%	394	22.6%

	2041 future baseline		2041 with Proposed Scheme (no mitigation)	
PM peak (17:00-18:00)	Unreleased vehicles	Proportion of demand	Unreleased vehicles	Proportion of demand
Station Link Road	52	4.3%	470	39.3%
Motorcycle Museum Exit	111	93.7%	55	46.2%
M6 east	248	5.7%	863	19.7%
M42 north (SB)	579	8.4%	1874	27.2%
Catherine De Barnes	0	0	1	0.2%
Starlet Way	0	0	320	73.4%
Elmdon Trading Estate	0	0	78	34.1%
Airport Way (Car Park)	0	0	472	51.1%
Viking Way (Car Park)	0	0	83	47.2%
Meriden Way	0	0	82	13.6%
Comets End Lane	0	0	41	19.2%
Hampton Lane	0	0	112	20.4%
Chester Road north (SB)	0	0	114	11.2%
Chelmsley Road	0	0	48	18.0%
Coleshill Road	0	0	165	38.0%
Bickenhill Road	0	0	49	19.4%
Proposed Scheme Station Interchange	0	0	296	16.8%
Yorkminster Drive	0	0	31	11.3%
Harbet Drive	0	0	75	59.8%
Perimeter Rd	0	0	88	44.5%

8.4.366 Table 8-162 shows that in the PM peak hour there are more locations where the model is unable to assign the total demand and these are located right across the network. This in due to the overall levels of demand in the network and the operation of key junctions including M42 junction 6, M6 junction 4, A45 Coventry Road/Damson Parkway and Stonebridge Island which were both shown in the future baseline to experience increasing queues and delays in 2041. The increased demand associated with Proposed Scheme results in a further deterioration in conditions particularly as these key junctions on the route into Birmingham Interchange. Junction performance is discussed in more detail below.

Junction performance 2041

M42 junction 6

8.4.367 Table 8-163 below shows the flow and maximum queues at M42 junction 6 in the weekday AM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-163: M42 junction 6 AM peak hour queue lengths (metres) - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

M42 junction 6	AM peak (08:00-09:00)			
	2041 future baseline		2041 with Proposed Scheme (no mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue
M42 north off-slip	1680	94	1046	4901
A45 Coventry Road east off-slip	1537	506	1675	571
National Motorcycle Museum*	n/a	n/a	n/a	n/a
M42 south off-slip	2449	1728	2334	2388
A45 Coventry Road west off-slip	1712	97	1534	500
south Way - Left Turn	485	46	319	259
south Way - Ahead		58		266

8.4.368 Table 8-164 below shows the flow and maximum queues at M42 junction 6 in the weekday PM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-164: M42 junction 6 PM peak hour queue lengths (metres) - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

M42 junction 6	PM peak (17:00-18:00)			
	2041 future baseline		2041 with Proposed Scheme (no mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue
M42 north off-slip	1754	3436	1282	4900
A45 Coventry Road east off-slip	2073	1518	1144	4009
National Motorcycle Museum*	n/a	n/a	n/a	n/a
M42 south off-slip	1713	3083	1556	3041
A45 Coventry Road west off-slip	2465	153	1883	2368
south Way - Left Turn	564	173	310	2079
south Way - Ahead		181		2087

8.4.369 Table 8-163 and Table 8-164 above show that in the AM and PM peak hours, the additional traffic demand associated with Birmingham Interchange station will result in queues on M42 junction 6 which impact on the operation of the M42 mainline and the A45 Coventry Road. It should be noted queues are forecast in the future baseline as well.

8.4.370 Table 8-165 below considers the operation of M42 junction 6 in terms of average journey times/delays and junction throughput the weekday AM peak hour.

Table 8-165: M42 junction 6 AM peak hour average journey times (seconds) and throughput - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

M42 junction 6	**AM peak**	
	2041 future baseline	**2041 with Proposed Scheme (no mitigation)**
junction Throughput (vehicles)	7864	6908
Average Travel Time per Vehicle (seconds)	126	139

8.4.371 Table 8-166 below shows the operation of M42 junction 6 in terms of average journey times/delays and junction throughput the weekday PM peak hour.

Table 8-166: M42 junction 6 PM peak hour average journey times (seconds) and throughput - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

M42 junction 6	**PM peak**	
	2041 future baseline	**2041 with Proposed Scheme (no mitigation)**
junction Throughput (vehicles)	8569	6175
Average Travel Time per Vehicle (seconds)	165	266

8.4.372 Table 8-165 and Table 8-166 above show that the increased network delays in 2041 as a result of the Proposed Scheme result in worsening journey times through M42 junction 6 and reduced throughput. This occurs due congestion on the wider network, and in particular on the route into/from Proposed Scheme affecting the ability of the network and key junctions to function efficiently.

M6 junction 4

8.4.373 Table 8-167 below shows the flow and maximum queues at M6 junction 4 in the weekday AM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-167: M6 junction 4 AM peak hour queue lengths (metres) - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

M6 junction 4	**AM peak (08:00-09:00)**			
	2041 future baseline		**2041 with Proposed Scheme (no mitigation)**	
	Flow (veh)	**Max queue**	**Flow (veh)**	**Max queue**
A446 Stonebridge Road (north)	1130	382	1064	381
M6 east off-slip	639	139	668	1428
A446 Stonebridge Road (south)	1341	38	1050	30
M6 west off-slip	1473	965	1708	189

8.4.374 Table 8-168 below shows the flow and maximum queues at M6 junction 4 in the weekday PM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-168: M6 junction 4 PM peak hour queue lengths (metres) - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

M6 junction 4	**PM peak (17:00-18:00)**			
	2041 future baseline		**2041 with Proposed Scheme (no mitigation)**	
	Flow (veh)	**Max queue**	**Flow (veh)**	**Max queue**
A446 Stonebridge Road (north)	1322	112	1474	321
M6 east off-slip	538	73	349	53
A446 Stonebridge Road (south)	1982	184	1646	240
M6 west off-slip	1210	1119	1380	841

8.4.375 Table 8-167 and Table 8-168 above show that in the AM peak hour the additional traffic associated with Birmingham Interchange station is expected to substantially increase queues on the M6 east off-slip at the junction. This is as a result of the additional traffic from the M6 west passing this approach. It should be noted that the queue is forecast to extend to the M6 mainline.

8.4.376 In the PM peak hour, there are no substantial changes as a result of the additional traffic associated with the Proposed Scheme.

8.4.377 Table 8-169 below considers the operation of M6 junction 4 in terms of average journey times/delays and junction throughput the weekday AM peak hour.

Table 8-169: M6 junction 4 AM peak hour average journey times (seconds) and throughput - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

M6 junction 4	**AM peak**	
	2041 future baseline	**2041 with Proposed Scheme (no mitigation)**
junction Throughput (vehicles)	4583	4489
Average Travel Time per Vehicle (seconds)	66	47

8.4.378 Table 8-170 below shows the operation of M6 junction 4 in terms of average journey times/delays and junction throughput the weekday PM peak hour.

Table 8-170: M6 junction 4 PM peak hour average journey times (seconds) and throughput - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

M6 junction 4	**PM peak**	
	2026 future baseline	**2026 with Proposed Scheme (no mitigation)**
junction Throughput (vehicles)	5052	4850
Average Travel Time per Vehicle (seconds)	59	52

8.4.379 Table 8-169 and Table 8-170 above shows a similar picture for M6 junction4 as for M42 junction 6 in that network congestion affects the potential throughout of the junction.

Stonebridge Island

8.4.380 Table 8-171 below shows the flow and maximum queues at Stonebridge Island in the weekday AM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-171: Stonebridge Island AM peak hour queue lengths (metres) - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

Stonebridge Island	AM peak (08:00-09:00)			
	2041 future baseline		2041 with Proposed Scheme (no mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue
A452 Chester Road	2091	350	2563	473
A45 east off-slip	299	158	292	686
A452 Kenilworth Road	1381	91	1568	791
A45 west off-slip - left turn	1467	377	1337	1523
A45 west off-slip - ahead		376		1522

8.4.381 Table 8-172 below shows the flow and maximum queues at Stonebridge Island in the weekday PM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-172: Stonebridge Island PM peak hour queue lengths (metres) - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

Stonebridge Island	PM peak (17:00-18:00)			
	2041 future baseline		2041 with Proposed Scheme (no mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue
A452 Chester Road	2440	476	1649	3396
A45 east off-slip	319	83	201	2531
A452 Kenilworth Road	1274	149	597	1853
A45 west off-slip - left turn	1201	218	1207	474
A45 west off-slip - ahead		212		470

8.4.382 Table 8-171 and Table 8-172 above show that the Proposed Scheme has a major impact on Stonebridge Island in both peak hours. This is expected as Stonebridge Island is the first major junction on the exit route from Proposed Scheme and combines traffic arriving from key routes into the station including the A45 Coventry Road and A452 Kenilworth Road.

8.4.383 Table 8-173 below considers the operation of Stonebridge Island in terms of average journey times/delays and junction throughput the weekday AM peak hour.

Table 8-173: Stonebridge Island AM peak hour average journey times (seconds) and throughput - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

Stonebridge Island	AM peak (08:00-09:00)	
	2041 future baseline	2041 with Proposed Scheme (no mitigation)
junction Throughput (vehicles)	5237	5760
Average Travel Time per Vehicle (seconds)	69	116

8.4.384 Table 8-174 below shows the operation of Stonebridge Island in terms of average journey times/delays and junction throughput the weekday PM peak hour.

Table 8-174: Stonebridge Island PM peak hour average journey times (seconds) and throughput - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

Stonebridge Island	PM peak (17:00-18:00)	
	2041 future baseline	2041 with Proposed Scheme (no mitigation)
junction Throughput (vehicles)	5233	3655
Average Travel Time per Vehicle (seconds)	57	141

8.4.385 As with the motorway junctions, Table 8-173 and Table 8-174 above show that the increased network delays in 2041 as a result of the Proposed Scheme result in worsening journey times through Stonebridge Island and reduced throughput particularly in the PM peak. This occurs due congestion on the wider network, and in particular on the route into/from Proposed Scheme affecting the ability of the network and key junctions to function efficiently.

A45 Coventry Road/Damson Parkway

8.4.386 Table 8-175 below shows the flow and maximum queues at the A45 Coventry Road/Damson Parkway traffic signal junction in the weekday AM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-175: A45 Coventry Road/Damson Parkway AM peak hour queue lengths (metres) - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

A45 Coventry Road/Damson Parkway	AM peak (08:00-09:00)			
	2041 future baseline		2041 with Proposed Scheme (no mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue
Terminal Road - Left Turn	221	141	225	143
Terminal Road - Ahead/ Right Turn		143		145
A45 Coventry Road (east) - Ahead	2299	178	2101	200
A45 Coventry Road (east) - Right Turn		62		50

Damson Parkway - Left Turn	757	37	755	32
Damson Parkway - Ahead/Right Turn		492		645
A45 Coventry Road (west) - Ahead	1966	1003	1953	1002
A45 Coventry Road (west) - Right Turn		64		63

8.4.387 Table 8-176 below shows the flow and maximum queues at in the weekday PM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-176: A45 Coventry Road/Damson Parkway PM peak hour queue lengths (metres) - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

A45 Coventry Road/Damson Parkway	**PM peak (17:00-18:00)**			
	2041 future baseline		**2041 with Proposed Scheme (no mitigation)**	
	Flow (veh)	**Max queue**	**Flow (veh)**	**Max queue**
Terminal Road - Left Turn	265	193	257	196
Terminal Road - Ahead/ Right Turn		194		197
A45 Coventry Road (east) - Ahead	2831	385	2142	531
A45 Coventry Road (east) - Right Turn		72		63
Damson Parkway - Left Turn	641	164	605	41
Damson Parkway - Ahead/Right Turn		645		644
A45 Coventry Road (west) - Ahead	2391	1001	2285	1000
A45 Coventry Road (west) - Right Turn		520		649

8.4.388 Table 8-175 and Table 8-176 above show that in the AM and PM peak hours the Proposed Scheme has minimal impact on queues at the junction. Queues are generally spread similar to the future baseline albeit are slightly longer.

8.4.389 Table 8-177 below considers the operation of the A45 Coventry Road/Damson Parkway traffic signal junction in terms of average journey times/delays and junction throughput the weekday AM peak hour.

Table 8-177: A45 Coventry Road/Damson Parkway AM Peak hour average journey times (seconds) and throughput - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

A45 Coventry Road/Damson Parkway	**AM peak (08:00-09:00)**	
	2041 future baseline	**2041 with Proposed Scheme (no mitigation)**
junction Throughput (vehicles)	5243	5034
Average Travel Time per Vehicle (seconds)	76	87

8.4.390 Table 8-178 below shows the operation of the A45 Coventry Road/Damson Parkway traffic signal junction in terms of average journey times/delays and junction throughput the weekday PM peak hour.

Table 8-178: A45 Coventry Road/Damson Parkway PM Peak hour average journey times (seconds) and throughput - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

A45 Coventry Road/Damson Parkway	PM peak (17:00-18:00)	
	2041 future baseline	2041 with Proposed Scheme (no mitigation)
junction Throughput (vehicles)	6129	5289
Average Travel Time per Vehicle (seconds)	75	98

8.4.391 Table 8-177 and Table 8-178 above show that in both the AM and PM peak hours journey times increase and throughput decreases. This pattern is similar to the other key junctions discussed above and a function of general network congestion in 2041 combined with Proposed Scheme trips.

A452 Chester Road/B4438 Bickenhill Parkway

8.4.392 Table 8-179 below shows the flow and maximum queues at the A452 Chester Road/B4438 Bickenhill Parkway roundabout junction (Birmingham Business Park) in the weekday AM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-179: A452 Chester Road/B4438 Bickenhill Parkway AM peak hour queue lengths (metres) - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

A452 Chester Road/B4438 Bickenhill Parkway	AM peak (08:00-09:00)			
	2041 future baseline		2041 with Proposed Scheme (no mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue
A446 north slips	927	114	n/a	n/a
A452 Chester Road south	830	173	n/a	n/a
B4438 Bickenhill Parkway	349	190	349	51
Solihull Parkway	163	13	163	10
A452 Chester Road north	1264	30	1264	13

8.4.393 Table 8-180 below shows the flow and maximum queues at in the weekday PM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-180: A452 Chester Road/B4438 Bickenhill Parkway PM peak hour queue lengths (metres) - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

A452 Chester Road/B4438 Bickenhill Parkway	PM peak (17:00-18:00)			
	2041 future baseline		2041 with Proposed Scheme (no mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue
A446 north slips	170	32	n/a	n/a
A452 Chester Road south	621	67	n/a	n/a
B4438 Bickenhill Parkway	487	25	317	134

A452 Chester Road/B4438 Bickenhill Parkway	PM peak (17:00-18:00)			
	2041 future baseline		2041 with Proposed Scheme (no mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue
Solihull Parkway	1529	246	1408	191
A452 Chester Road north	1001	1051	695	188

8.4.394 Table 8-179 and Table 8-180 above show that in the AM peak hour, there are not forecast to be any substantial queues at the junction. Queues develop on the A446 north slips, A452 Chester Road south and B4438 Bickenhill Parkway as a result of traffic accessing Birmingham Business Park but queues are contained in the available storage capacity

8.4.395 In the PM peak hour queues are observed on the junction particularly on Solihull Parkway and the A452 Chester Road north but these are not considered to be substantial.

8.4.396 As noted above the existing roundabout junction is replaced by a series of three roundabout junctions and associated link roads. Table 8-181 and Table 8-182 summarise the queue results for the two further new junctions, which are not included in Table 8-179 and Table 8-180 above.

Table 8-181: B4438 Bickenhill Parkway/Northway peak hour queue lengths (metres) - 2041 with Hs2 (no mitigation)

B4438 Bickenhill Parkway/Northway roundabout	AM Peak (08:00-09:00)	PM Peak (17:00-18:00)
	Max queue	Max queue
B4438 (north)	155	313
New Link from Interchange Roundabout	67	192
Northway	269	194
B4438 (south)	171	37

Table 8-182: New Proposed Scheme Birmingham Interchange Access/A446 Links/A452 Links peak hour queue lengths (metres) - 2041 with Hs2 (no mitigation)

Proposed Scheme Birmingham Interchange Access roundabout	AM Peak (08:00-09:00)	PM Peak (17:00-18:00)
	Max queue	Max queue
A446 Link Road (north)	75	32
A452 Link Road (south)	91	0
Proposed Scheme Egress 1	12	169
Proposed Scheme Egress 2	5	266
A452 Link Road (north)	26	143

8.4.397 Table 8-179 to Table 8-182 above show that there are not forecast to be any substantial queues. There are transient queues which result in some long maximum queues but these clear relatively quickly.

8.4.398 Table 8-183 below considers the operation of the network of three junctions compared with the existing A452 Chester Road/B4438 Bickenhill Parkway roundabout junction in terms of average journey times/delays and junction throughput the weekday AM peak hour.

Table 8-183: A452 Chester Road/B4438 Bickenhill Parkway AM peak hour average journey times (seconds) and throughput - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

A452 Chester Road/B4438 Bickenhill Parkway	**AM peak (08:00-09:00)**	
	2041 future baseline	**2041 with Proposed Scheme (no mitigation)**
junction Throughput (vehicles)	3998	4624
Average Travel Time per Vehicle (seconds)	75	108

8.4.399 Table 8-184 below shows the operation of the network of three junctions compared with the existing A452 Chester Road/B4438 Bickenhill Parkway roundabout junction in terms of average journey times/delays and junction throughput the weekday PM peak hour.

Table 8-184: A452 Chester Road/B4438 Bickenhill Parkway PM Peak hour average journey times (seconds) and throughput - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

A452 Chester Road/B4438 Bickenhill Parkway	**PM peak**	
	2041 future baseline	**2041 with Proposed Scheme (no mitigation)**
junction Throughput (vehicles)	4123	3897
Average Travel Time per Vehicle (seconds)	97	124

8.4.400 Table 8-183 and Table 8-184 above show that there is no substantial difference in average journey times through the junction. Journey times are forecast to increase by around 44% in the AM peak hour but this is associated with a 16% increase in throughput. In the PM peak, average journey times increase and throughput falls which is expected to be a consequence of wider congestion on the network.

A45 Coventry Road/B4438 Catherine-de-Barnes Lane

8.4.401 Table 8-185 below shows the flow and maximum queues at the A45 Coventry Road/B4438 Catherine-de-Barnes Lane roundabout junction in the weekday AM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-185: A45 Coventry Road/B4438 Catherine-de-Barnes Lane AM peak hour queue lengths (metres) - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

A45 Coventry Road/B4438 Catherine-de-Barnes Lane	AM peak (08:00-09:00)			
	2041 future baseline		2041 with Proposed Scheme (no mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue
B4438 Bickenhill Lane	1155	57	1225	33
A45 east off-slip	2774	84	2655	167
B4438 Catherine De Barnes	783	50	782	157
A45 west off-slip	1703	17	2107	54

8.4.402 Table 8-186 below shows the flow and maximum queues at in the weekday PM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-186: A45 Coventry Road/B4438 Catherine-de-Barnes Lane PM peak hour queue lengths (metres) - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

A45 Coventry Road/B4438 Catherine-de-Barnes Lane	PM peak (17:00-18:00)			
	2041 future baseline		2041 with Proposed Scheme (no mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue
B4438 Bickenhill Lane	2425	12	1563	215
A45 east off-slip	2419	194	1833	64
B4438 Catherine De Barnes	618	73	597	109
A45 west off-slip	1939	56	1743	18

8.4.403 Table 8-185 and Table 8-186 above show that maximum queues increase.

8.4.404 Table 8-187 below considers the operation of the A45 Coventry Road/B4438 Catherine-de-Barnes Lane roundabout junction in terms of average journey times/delays and junction throughput the weekday AM peak hour.

Table 8-187: A45 Coventry Road/B4438 Catherine-de-Barnes Lane AM peak hour average journey times (seconds) and throughput - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

A45 Coventry Road/B4438 Catherine-de-Barnes Lane	AM peak	
	2041 future baseline	2041 with Proposed Scheme (no mitigation)
junction Throughput (vehicles)	6415	6769
Average Travel Time per Vehicle (seconds)	23	25

8.4.405 Table 8-188 below shows the operation of the A452 Chester Road/B4438 Bickenhill Parkway roundabout junction in terms of average journey times/delays and junction throughput the weekday PM peak hour.

Table 8-188: A45 Coventry Road/B4438 Catherine-de-Barnes Lane PM peak hour average journey times (seconds) and throughput - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

A45 Coventry Road/B4438 Catherine-de-Barnes Lane	PM peak	
	2041 future baseline	2041 with Proposed Scheme (no mitigation)
junction Throughput (vehicles)	7401	5736
Average Travel Time per Vehicle (seconds)	23	63

8.4.406 Table 8-187 and Table 8-188 above show that in the AM peak throughput increases but there no substantial impact on journey times. In the PM peak, throughout decreases and average journey times increase indicating that wider congestion and rerouting are impacting on the operation of the junction.

A452 Chester Road/Coleshill Heath Road roundabout

8.4.407 Table 8-189 below shows the flow and maximum queues at the A452 Chester Road/Coleshill Heath Road roundabout in the weekday AM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-189: A452 Chester Road/Coleshill Heath Road roundabout AM peak hour queue lengths (metres) - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

A452 Chester Road/Coleshill Heath Road	AM peak (08:00-09:00)			
	2041 future baseline		2041 with Proposed Scheme (no mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue
Coleshill Heath Road (north)	425	974	679	1325
Chester Road (east)	818	36	615	26
Coleshill Heath Road (south)	570	103	712	156
Chester Road (west)	1300	1294	1007	1299

8.4.408 Table 8-190 below shows the flow and maximum queues at in the weekday PM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-190: A452 Chester Road/Coleshill Heath Road PM peak hour queue lengths (metres) - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

A452 Chester Road/Coleshill Heath Road	PM peak (17:00-18:00)			
	2041 future baseline		2041 with Proposed Scheme (no mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue
Coleshill Heath Road (north)	778	594	847	1256
A452 Chester Road (east)	1504	356	1006	1353
Coleshill Heath Road (south)	368	199	430	807
A452 Chester Road (west)	1002	151	878	66

8.4.409 As in 2026, Table 8-189 and Table 8-190 above show that queues are forecast to increase in both the AM and PM peak hours. It should be noted that the demand to/from Birmingham Interchange station from this area is not expected to be substantial. The increase in queues is related to traffic re-routing due to wider network congestion and existing A452 Chester Road/B4438 Bickenhill Parkway roundabout to accommodate the Proposed Scheme. This results in some traffic rerouting via Coleshill Heath Road and thereby having an impact on the A452 Chester Road/Coleshill Heath Road roundabout.

8.4.410 Table 8-191 below considers the operation of A452 Chester Road/Coleshill Heath Road roundabout junction in terms of average journey times/delays and junction throughput the weekday AM peak hour.

Table 8-191: A452 Chester Road/Coleshill Heath Road AM Peak hour average journey times (seconds) and throughput - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

A452 Chester Road/Coleshill Heath Road	**AM peak**	
	2041 future baseline	**2041 with Proposed Scheme (no mitigation)**
junction Throughput (vehicles)	3113	3013
Average Travel Time per Vehicle (seconds)	145	172

8.4.411 Table 8-192 below shows the operation of the A452 Chester Road/Coleshill Heath Road roundabout junction in terms of average journey times/delays and junction throughput the weekday PM peak hour.

Table 8-192: A452 Chester Road/Coleshill Heath Road PM Peak hour average journey times (seconds) and throughput - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

A452 Chester Road/Coleshill Heath Road	**PM peak**	
	2041 future baseline	**2041 with Proposed Scheme (no mitigation)**
junction Throughput (vehicles)	3652	3161
Average Travel Time per Vehicle (seconds)	49	85

8.4.412 Table 8-191 and Table 8-192 above shows that average journey times through the junction increase in the AM peak hour but are not so substantial in the PM peak hour.

Route Travel Times 2041

M42 junction 6-J7

8.4.413 Table 8-193 below summarises the change in journey times on the M42 in the weekday AM peak hour for 2041 future baseline and with Proposed Scheme (no mitigation). Results have been extracted from the validated and future years VISSIM models.

Table 8-193: M42 travel time AM peak hour (seconds) - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

AM peak (08:00-09:00)	2041 future baseline	2041 with Proposed Scheme (no mitigation)
northbound	319	370
southbound	327	385

8.4.414 Table 8-194 below summarises the change in journey times on the M42 in the weekday PM peak hour for 2041 future baseline and with Proposed Scheme (no mitigation). Results have been extracted from the validated and future years VISSIM models.

Table 8-194: M42 travel time PM peak hour (seconds) - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

PM peak (17:00-18:00)	2041 future baseline	2041 with Proposed Scheme (no mitigation)
northbound	426	472
southbound	346	443

8.4.415 Table 8-193 and Table 8-194 above show that the Proposed Scheme has minimal impact on travel times on the M42 in the AM peak hour. The impact in the PM peak hour is more substantial particularly in the southbound direction. This is expected to be related to the queues at Stonebridge Island and M42 junction 6 which have a knock-on impact on the operation of the motorway mainline.

A45 Coventry Road between Goodway Road and Shepherds Lane

8.4.416 Table 8-195 below summarises the change in journey times on the A45 Coventry Road in the weekday AM peak hour for 2041 future baseline and with Proposed Scheme (no mitigation). Results have been extracted from the validated and future years VISSIM models.

Table 8-195: A45 Coventry Road travel time AM peak hour (seconds) - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

AM peak (08:00-09:00)	2041 future baseline	2041 with Proposed Scheme (no mitigation)
eastbound	486	571
westbound	379	386

8.4.417 Table 8-196 below summarises the change in journey times on the A45 Coventry Road in the weekday PM peak hour for 2041 future baseline and with Proposed Scheme (no mitigation). Results have been extracted from the validated and future years VISSIM models.

Table 8-196: A45 Coventry Road travel time PM peak hour (seconds) - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

PM peak (17:00-18:00)	2041 future baseline	2041 with Proposed Scheme (no mitigation)
eastbound	421	635
westbound	465	773

8.4.418 Table 8-195 and Table 8-196 above show a similar picture for the A45 Coventry Road as is seen for the M42. The Proposed Scheme has minimal impact on travel times in the AM peak hour westbound but a much more substantial impact eastbound and in the PM peak hour. This is again expected to be related to the queues at Stonebridge Island and M42 junction 6.

A446 between Stonebridge Island and A446 Stonebridge Road/B4117 Coventry Road junction

8.4.419 Table 8-197 below summarises the change in journey times on the A446 in the weekday AM peak hour for 2041 future baseline and with Proposed Scheme (no mitigation). Results have been extracted from the validated and future years VISSIM models.

Table 8-197: A446 Coventry Road travel time AM peak hour (seconds) - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

AM peak (08:00-09:00)	2041 future baseline	2041 with Proposed Scheme (no mitigation)
northbound	228	254
southbound	552	511

8.4.420 Table 8-198 below summarises the change in journey times on the A446 in the weekday PM peak hour for 2041 future baseline and with Proposed Scheme (no mitigation). Results have been extracted from the validated and future years VISSIM models.

Table 8-198: A446 travel time PM peak hour (seconds) - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

PM peak (17:00-18:00)	2041 future baseline	2041 with Proposed Scheme (no mitigation)
northbound	234	257
southbound	271	877

8.4.421 Table 8-197 and Table 8-198 above show that in the PM peak there is an increase in travel times in the southbound direction which is likely to be related to traffic leaving Birmingham Interchange station impacting on Stonebridge Island.

A452 between Cornet's End Roundabout and A452 Chester Road/Coleshill Heath Road Roundabout

8.4.422 Table 8-199 below summarises the change in journey times on the A452 in the weekday AM peak hour for 2041 future baseline and with Proposed Scheme (no mitigation). Results have been extracted from the validated and future years VISSIM models.

Table 8-199: A452 travel time AM peak hour (seconds) - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

AM peak (08:00-09:00)	2041 future baseline	2041 with Proposed Scheme (no mitigation)
northbound	332	501
southbound	359	372

8.4.423 Table 8-200 below summarises the change in journey times on the A452 in the weekday PM peak hour for 2041 future baseline and with Proposed Scheme (no mitigation). Results have been extracted from the validated and future years VISSIM models.

Table 8-200: A452 travel time PM peak hour (seconds) - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

PM peak (17:00-18:00)	2041 future baseline	2041 with Proposed Scheme (no mitigation)
northbound	318	588
southbound	483	1022

8.4.424 The impacts on this route are associated with increased congestion on Stonebridge Island and on the A452 Chester Road as a result of the Proposed Scheme.

Summary of highway assessment

8.4.425 The analysis of the highway network undertaken above clearly shows that congestion and the operation of key junctions in 2026 and 2041 has a substantial impact on the performance of the network. The additional of traffic associated with Proposed Scheme adds to these issues.

8.4.426 In order to mitigate the impact of the Proposed Scheme mitigation measures are proposed to M42 junction 6, M6 junction 4 and Stonebridge Island. These are discussed in detail in the section on Mitigation of Impacts including an assessment of the impacts.

Accidents and safety

8.4.427 The baseline safety assessment identified no locations at which there have been nine or more accidents over the last three year period and there are no safety analyses and reports for the future baseline assessment.

8.4.428 Increases in traffic have the potential to result in an increase in accidents however, it is not expected that the Proposed Scheme will have any substantial impacts in the Birmingham Interchange and Chelmsley Wood area (in terms of either the 2026 or 2041 operation assessments), as there are no locations where there are existing highway safety issues or substantial increases in traffic due to the Proposed Scheme.

Public transport

8.4.429 The Proposed Scheme will include a number of features at Birmingham Interchange station which are designed to ensure that Proposed Scheme is connected into the wider public transport network. These include:

- dedicated bus/coach bays at Birmingham Interchange station;
- a dedicated people mover to connect Birmingham Interchange station to the multi-modal interchange at Birmingham International rail station and Birmingham Airport; and

- access via the people mover to the network of existing footpaths and cycle links connect that are around the NEC, Birmingham International rail station and Birmingham Airport area.

8.4.430 The demand for public transport trips has been based on a combination of PLANET Proposed Scheme forecast and a detailed analysis of mode share for Proposed Scheme. This has been outlined in the operational traffic generation section of the Transport Assessment report and is summarised in the table below.

Table 8-201: Proposed Scheme Birmingham Interchange station sub-mode forecasts (person trips by mode)

Demand/mode	2026 (Phase Two)		2041 (Phase Two)	
	AM peak hour	PM peak hour	AM peak hour	PM peak hour
	Boarders/Alighters	Boarders/Alighters	Boarders/Alighters	Boarders/Alighters
Total Proposed Scheme Passengers	1963	2098	3467	3696
Car (parked)	932	1095	1621	1893
Kiss and Ride	186	74	324	128
Taxi	103	190	178	330
People Mover (comprising of):				
Bus*	75	84	131	146
Walk/Cycle	141	101	244	175
Other Trains	437	471	817	883
People Mover on to Airport	89	82	154	141

* bus trips included under people mover to assess robust people mover demands assuming Proposed Scheme bus passengers use Birmingham International station multi-modal interchange.

8.4.431 This section set out the analysis undertaken of the impacts of Hs2 on the public transport network area within this area. This builds on the methodology outlined in Section x above that described the approach and the baseline information used for the public transport analysis.

8.4.432 The analysis focuses on the impacts on the public transport network, as well as the connectivity between Interchange Station and Birmingham International Station.

Rail

8.4.433 Table 8-202 shows the typical travel time between Birmingham International and London Euston on fast west Coast Main Line services compared with the expected typical travel time between Birmingham Interchange Station and London Euston on Proposed Scheme.

Table 8-202: Birmingham-London journey time comparison

	Journey time (mins)
Birmingham International-London Euston (west Coast Mainline)	68
Birmingham Interchange-London Euston (west Coast Mainline)	38

8.4.434 Table 8-202 shows that Proposed Scheme will provide travellers between London and Birmingham the potential for substantially faster journeys when compared with existing strategic rail services.

8.4.435 Proposed Scheme will also substantially increase rail capacity between Birmingham and London through the additional capacity that is provided by Proposed Scheme but also through released capacity on the west Coast Main Line. Table 8-203 summarises the demand for long distance trip on the west Coast Main Line in 2026 and 2041 with and without Proposed Scheme in place as forecast in the PLANET model.

Table 8-203: Birmingham-International - change in long-distance trip demand between Birmingham International-London Euston with Proposed Scheme

	2026 (Phase One)			2041 (Phase Two)		
	Future baseline	With Hs2	% Diff	Future baseline	With Hs2	% Diff
Birmingham International	10,186	4,734	-54%	12,118	5,331	-56%

8.4.436 Table 8-203 shows that Proposed Scheme will also release capacity on the west Coast Main Line.

8.4.437 The impacts of Proposed Scheme on the local rail network are expected to be two-fold. The local rail network will provide a means of access to Proposed Scheme and will also release capacity on the classic rail network providing the potential for increase local service provision on the local rail network. Whilst the routes that may benefit are subject to detailed assessment by other, work undertaken by the integrated transport authority Centro, positively promotes the benefits of released capacity at Birmingham International station which could improve connections around the region.

8.4.438 Table 8-203 above shows the interchange rail demand generated by Proposed Scheme at Birmingham Interchange station. These are passengers who board/alight Proposed Scheme and interchange to rail services at Birmingham International rail station (local and strategic) via the people mover. These have been included in the people mover demand assessment to ensure that appropriate connectivity to Birmingham International rail station services is provided.

Public transport interchange

8.4.439 At Interchange station public transport interchange will take place via two modes. Firstly, Hs2 passengers will be able to access bus services directly outside of the station concourse. The design allows for at least two bus stands allowing bus services to access the station. The forecast number of trips to be undertaken by bus in the AM and PM Peak hours in 2026 and 2041 are shown in Table 8-204 below.

Table 8-204: Proposed Scheme Birmingham Interchange station; bus patronage forecast (passengers trips)

Time period	Board/Alight	2026 Phase One	2041 Phase Two
AM (08:00-09:00)	Boarders	51	89
	Alighters	24	41
PM (17:00-18:00)	Boarders	7	13
	Alighters	77	133

8.4.440 The results show that the maximum forecast bus demand is in the PM peak hour in 2041, with 133 alighting passengers from Hs2 services leaving the station by bus. The analysis undertaken in Section X above identified the primary locations that are expected to generate potential public transport trips to Birmingham Interchange which included Solihull and the western suburbs of Birmingham.

8.4.441 Whist there are no services that serve the site at present, Proposed Scheme will work with service providers through the delivery of the station to ensure that existing and future bus services provide maximum opportunities for passengers to access Birmingham Interchange station as well as existing transport nodes in the area such as the multimodal interchange at Birmingham International station and Birmingham Airport as well as key land uses.

8.4.442 As part of the Birmingham Interchange station it will be possible to connect between the station and Birmingham International station/NEC and Birmingham Airport via the proposed people mover system. A full assessment of the people mover system and demand has been undertaken and a summary is provided below.

8.4.443 The forecast demand for the people mover was developed based upon available data sources. Three separate demand scenarios (known as D1, D2 and D3) were developed, they were:

- D1: People mover demand based on Proposed Scheme delivered demand;
- D2: People Mover demand based on external (NEC and airport) demand; and
- D3: People Mover demand, increased to inform scalability requirements.

8.4.444 The three demand scenarios were developed to ensure a robust design for the people mover. The forecasts known as D1 and D2 were derived in order to provide a robust analysis of potential demand based on two different data sets. D1 was based on the assumptions used in the Transport Assessment for the Interchange Station, using the PLANET PFM Interchange station forecasts and modal access proportions. D2 used data taken from Birmingham Airport, NEC and other stakeholders in the local area to derive potential demand for the people mover.

D1: Proposed Scheme Delivered Demand

8.4.445 The People Mover demand in the TA consists of:

- Proposed Scheme generated trips between Birmingham Interchange Station and the other People Mover stops at the airport, Birmingham International station and the NEC, based on the PFM forecast for Boarders/Alighters at Interchange Station and the forecast modal access proportions developed for the TA ;
- trips between the airport and Birmingham International station (based on the current number of trips currently being made on the AirRail Link, counted as part of the surveys undertaken in June 2012 for Proposed Scheme, together with a growth forecast applied based on the Airport Masterplan published in 2007 with growth to 2030. It was also assumed that there would be an increase in the number of passengers accessing the Airport by rail in 2030, in line with the Airport's Masterplan target of increasing the public transport mode share from 20.2% in 2006 to 35% in 2030 ; and
- trips generated by the NEC Resortsworld development, based on the Transport Assessment used to support the successful planning application for the site.

8.4.446 It is also assumed that:

- trips between the NEC, the NEC Resortsworld and the LG Arena and Birmingham International station will walk and not use the People Mover. This is because there are well defined walk links between these locations that provide quick and easy access, and to undertake these trips via the people mover could involve slower total journey times.
- trips between the NEC and the airport are assumed to be negligible and are therefore excluded. The proportion of trips that access the NEC via the airport is less than 1% according to the results of the NEC 2011 visitor survey.
- trips between the airport and Birmingham International station were calculated by applying the airport master plan's passenger growth forecasts to the current surveyed AirRail Link usage. As outlined above, these were based on figures provided in the Birmingham Airport Masterplan, published in November 2007. As outlined above an increase in rail mode share for trips from the Airport was assumed in line with the Airport's Masterplan target for public transport mode share.

8.4.447 NEC Resortsworld trips were obtained from the NEC Resortsworld Transport Assessment.

8.4.448 The estimated passenger numbers between People Mover stops during a typical weekday (16 hrs), AM Peak hour (08:00-09:00) and PM Peak hour (17:00 –18:00) are shown in Table 8-205 and Figure 8-10 and Figure 8-11. The peak hour flows were calculated from the 16 hour flows according to proportions calculated from the peak hour factors used in the Transport Assessment. These are the expected peak hours of use for the system based on the time period profiles developed for Proposed Scheme demand in the Birmingham Interchange Transport Assessment. These profiles estimated that there would be 14% of Boarders and 4% of Alighters in the period 08:00-09:00 and 2% of Boarders and 19% of Alighters in the period 17:00-18:00.

Table 8-205: Forecast People Mover demand (D1 Scenario)

	Direction	Airport - International	International - NEC	NEC - Interchange
All day	eastbound	11000	6300	8200
	westbound	11700	6100	7300
08:00-09:00	eastbound	900	800	900
	westbound	600	300	500
17:00-18:00	eastbound	1000	200	200
	westbound	1200	1000	1100

Figure 8-10: People Mover demand, 2041 Phase Two, Proposed Scheme delivered demand scenario, AM peak hour (08:00-09:00), passenger trips

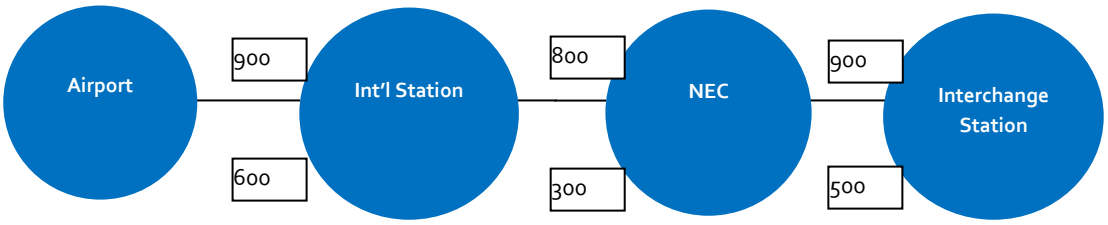
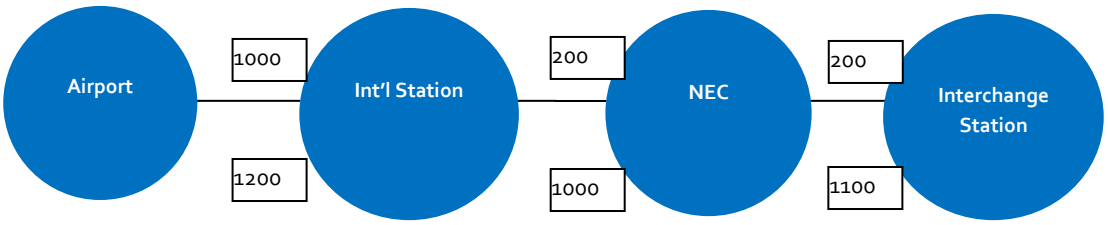


Figure 8-11: People Mover demand, 2041 Phase Two, Proposed Scheme delivered demand scenario, PM peak hour (17:00-18:00), passenger trips



8.4.449 Table 8-205 predicts that the busiest hourly flow in one direction is 1,200 passengers travelling westbound between the Airport and International Station in the PM Peak. The highest flow from Interchange Station is in the westbound direction in the PM Peak with 1,100 passengers per hour.

D2: External Generated Demand

8.4.450 The D2 People Mover demand forecast approached the forecast of People Mover demand from an alternative approach by undertaking an analysis of the likely demand generated for the system between from external sources in the area around Interchange Station. These external sources included Birmingham Airport, the NEC, LG Arena and other associated local development.

8.4.451 Of the above, airport users travelling by rail have been calculated from forecast air passenger and employee numbers in the airport master plan. Data from the CAA Passenger survey was used to calculate the number of non-flying airport visitors (wavers and greeters). AirRail Link survey data was used to estimate the proportions of the daily traffic travelling during peak hours.

8.4.452 NEC visitor numbers via air and rail were calculated from NEC attendance figures and NEC visitor survey data. NEC Resortsworld visitor numbers were obtained from NEC Resortsworld Transport Assessment data.

8.4.453 Passengers transferring between Interchange and International stations were obtained from the PFM.

8.4.454 The estimated passenger numbers between People Mover stops are given for a typical weekday (16 hour), AM Peak hour and PM Peak hour in Table 8-206 below and for the peak hours in Figure 8-12 and Figure 8-13.

Table 8-206: Forecast People Mover demand (D2 Scenario)

	Direction	Airport - International	International - NEC	NEC - Interchange
All Day	eastbound	13400	10600	12100
	westbound	13400	10600	12300
08:00-09:00	eastbound	800	1000	1000
	westbound	1600	400	1100
17:00-18:00	eastbound	1900	600	1200
	westbound	1000	1300	1300

Figure 8-12: People Mover demand, 2041 Phase Two, external generated demand scenario, AM peak hour (08:00-09:00), passenger trips

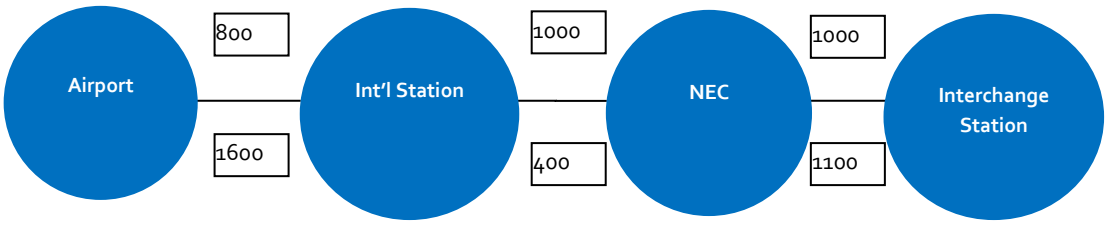
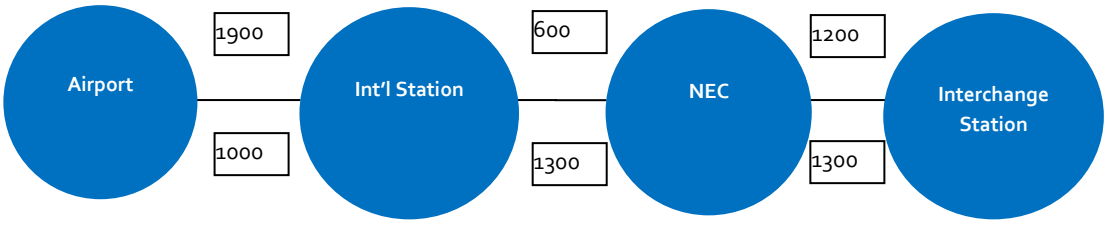


Figure 8-13: People Mover demand, 2041 Phase Two, external generated demand scenario, PM peak hour (17:00-18:00), passenger trips



8.4.455 Table 8-206 predicts that the busiest hourly demand in one direction is 1900 passengers travelling in the eastbound direction on the section between the airport and Birmingham International station in the PM Peak hour. The maximum flow generated from Birmingham Interchange station (to the NEC) is in the PM Peak in the westbound direction with 1300 passengers per hour.

D3: Scalability Scenario

8.4.456 A high estimate of the People Mover demand was prepared to determine the demand to which the system may have to be scalable. This is in response to the aspiration not to preclude future stakeholder requirements in terms of the level of demand to be serviced by the people mover. For this scenario it was assumed that all airport passengers and visitors will park at the Birmingham Interchange Station car park and therefore travel to the airport via the People Mover. The same hourly airport passenger profile has been assumed as for the external generated demand described in Section 4, in order to calculate the peak hour demand. This scenario is based on the D2 Scenario forecast for 2041.

8.4.457 This demand estimate for airport passengers and visitors parking at Interchange Station was added to the demand from airport employees, the NEC and trips between Birmingham International and Birmingham Interchange stations, as detailed above. The airport generated traffic was forecast to add an additional 3000-3500 trips to the total demand for the people mover in this scenario.

8.4.458 The resulting number of passengers provides a high estimate of the People Mover demand. Assuming all airport passengers and visitors would travel via the People Mover stop at Birmingham Interchange Station, the busiest section of the People Mover would be that between the NEC and Birmingham Interchange Station, with up to 4600 passengers on a typical day. The demand for movement between Interchange and the NEC could be expected to increase up to 5300 passengers during a major event at the NEC. However, the assumption used in this scenario is that this additional demand during a major event would be catered for by other means such as specific bus services.

Pedestrian, cyclist and equestrian

8.4.459 The demand for pedestrian and cycle trips is shown in Table 8-107 and Table 8-201 above. It is estimated that by 2041, the Proposed Scheme will produce around 250 walk/cycle trips in the AM peak hour and 180 walk/cycle trips in the PM peak hour. The assessment undertaken has assumed that the majority of these trips will be destined for locations in and around existing land uses including the NEC (including the new Resortsworld development), Birmingham Business Park, Trinity Park and Elmdon Trading Estate and will use the people mover to access the local movement network. Nevertheless, the design of Birmingham Interchange station and the internal circulation roads includes provision for both pedestrians and cyclists in the form of dedicated footway/cycleways and cycle parking provision well located at the station.

8.4.460 There are no committed changes in the facilities for pedestrians and cyclists in the Birmingham Interchange and Chelmsley Wood area other than those already identified under future baseline or those required to facilitate the Proposed Scheme.

8.4.461 Relative to construction of the proposed scheme, there will be no adverse impact on PRoW resulting from the operation of Proposed Scheme will be lower as PRoW will be re-instated or diverted.

8.4.462 There will be 8 roads realigned. Most are associated with the replacement of the existing A452 Chester Road/A446 Stonebridge Road/Solihull Parkway roundabout which is removed to accommodate the Proposed Scheme and is replaced by three junctions resulting in increased walking distances of up to 1.3km.

8.4.463 There will be an impact on pedestrians who use Middle Bickenhill Lane. Whilst Middle Bickenhill Lane will be maintained for access to properties, any pedestrian or cyclist using the full length of Middle Bickenhill Lane will need to use alternative routes via the A45 Coventry Road and A452 Chester Road. These routes have some sections of footways but on other sections there are not. Whilst journey distance and times could be substantially longer the number of users impacted is expected to be small with only 3 users per day recorded on Middle Bickenhill Lane during the surveys.

8.4.464 There will be minor amendments to PRoW FP M114 (A45/Service Road to Diddington Lane), FP M96 (to the east of A452 Chester Road) and FP M105 (adjacent to Melbicks). These amendments will be required to ensure that the PRoW appropriately tie into the new infrastructure and will have no impact on the operation of these PRoW.

8.4.465 There are no specific impacts on cycling in the Birmingham Interchange and Chelmsley Wood area other than where they affect pedestrians which are identified above.

8.4.466 It is not expected that the Proposed Scheme will have any substantial impacts on equestrian facilities in the Birmingham Interchange and Chelmsley Wood area.

Taxis

8.4.467 Table 8-201 above identifies the demand for taxi trips to/from Birmingham Interchange station. The proposed station layout includes taxi provision to meet the forecast demand.

8.4.468 The Proposed Scheme will also have an impact on the taxi holding area at Birmingham Airport. As identified under the construction assessment, the proposed alignment of the people mover crosses the existing taxi holding area at Birmingham Airport. The exact loss in spaces will be dependent on the final design of the people mover supports but is presently estimated at around 16 spaces. The taxi holding area has occupied different locations within the airport site and Proposed Scheme will continue to work with Birmingham Airport to ensure that any impact is minimised.

Waterways and canals

8.4.469 There are no navigable waterways or canals in the Birmingham Interchange and Chelmsley Wood area.

Parking

8.4.470 The development of Birmingham Interchange station includes car parking provision for Proposed Scheme users which has been derived from the forecast PLANET demand and forecast mode share for Proposed Scheme. Table 8-207 summarises the forecast car parking accumulation in 2026 and 2041.

Table 8-207: Birmingham Interchange forecast car parking accumulations 2026 and 2041

Time period	Parking accumulation 2026	Parking accumulation 2041
05:00-06:00	1271	2216
06:00-07:00	1596	2781
07:00-08:00	2244	3912
08:00-09:00	2631	4592
09:00-10:00	2735	4777
10:00-11:00	2833	4956
11:00-12:00	2977	5212
12:00-13:00	3000	5256
13:00-14:00	3215	5639
14:00-15:00	3211	5633
15:00-16:00	3179	5583

Time period	Parking accumulation 2026	Parking accumulation 2041
16:00-17:00	2995	5274
17::00-18:00	2412	4279
18:00-19:00	1702	3065
19:00-20:00	1217	2236
20:00-21:00	864	1632

8.4.471 Table 8-207 above shows that the peak parking demand in 2026 is forecast to be for 3,215 spaces and the peak parking demand in 2041 is forecast to be for 5,639. The Proposed Scheme includes provision for 6,400 car parking spaces. The additional car parking provision is required to ensure that the station is able to meet daily variations, provide some residual capacity for circulation and also employee parking.

8.4.472 The Proposed Scheme will also have an impact on car parking at a number of off-site locations. These include a loss of car parking spaces at the NEC and Birmingham International rail station to accommodate the alignment of the people mover and a loss of car parking spaces at businesses on Birmingham Business Park and at Melbicks Garden and Leisure Centre to accommodate the proposed highways works which are required to replace the existing A452 Chester Road/B4338 Bickenhill Parkway roundabout. Table 8-208 summarises the estimated losses.

Table 8-208: Proposed Scheme car parking impacts

Site	Number of spaces lost
NEC	96
Birmingham International Station	88
west Car Park	16
Birmingham Business Park	39
Melbicks Garden and Leisure Centre	45

8.4.473 Table 8-207 and Table 8-208 shows that there will be approximately 96 car parking spaces lost at the NEC which equates to around 0.5% of the total parking provision at the NEC. This loss is not considered to be substantial.

8.4.474 There will be approximately 92 car parking spaces lost at Birmingham International station. This includes a loss of 88 spaces in the main passenger car park (4%), and a loss of four spaces in the Network Rail staff car park (6.7%) and is not considered to be substantial.

8.4.475 There will be approximately 16 car parking spaces lost from the west Car Park which equates to around 0.3% of the total parking provision and is not considered to be substantial.

8.4.476 The realignment of the A446 Stonebridge Road will result in a loss of approximately 45 car parking spaces at Melbicks Garden and Leisure Centre. The impact is not expected to be substantial.

8.4.477 The replacement of the A452 Chester Road/B4338 Bickenhill Parkway roundabout will result in a loss of approximately 39 car parking spaces at Fujitsu on Birmingham Business Park however it is expected that these spaces can be re-provided and therefore the impact is not expected to be substantial.

8.4.478 Proposed Scheme Ltd will work with the businesses affected to identify opportunities where reasonably practical to mitigate impacts on parking.

8.4.479 In addition to car parking, Birmingham Interchange station will also include drop-off and pick-up facilities to meet the demand for kiss and ride identified in Table X.

Air transport

8.4.480 The Proposed Scheme will have direct links to Birmingham Airport via the people mover. The assessments undertaken of the people mover have considered the growth of Birmingham Airport as detailed in the airport master plan to ensure that the people mover is appropriately designed and sized.

8.4.481 Birmingham Airport will benefit from the Proposed Scheme through the improvements in public transport that Proposed Scheme will provide. Proposed Scheme will not only increase rail capacity but also shorten journey times which will make travel via Birmingham Airport more attractive. Furthermore, as part of its obligations, the airport has a requirement to improve its public transport mode share as the airport grows. Proposed Scheme will potentially play a role in achieving this.

Birmingham interchange and Chersley Wood (CFA24) Proposed Scheme mitigation of impacts

Stategic and local road network traffic flows

8.4.482 As outlined above, the highway network is forecast to come under increasing pressure due to general traffic growth even without Proposed Scheme. The Proposed Scheme proposals will generate additional vehicular traffic in the local area which has been shown to further adversely affect the operation of the network. The analysis undertaken above has shown that key nodes on the network play a role in maintaining flow on the network. Proposed Scheme therefore proposes a series of mitigation measures aimed at ensuring that the highway network in the vicinity of the Proposed Scheme continues to operate at condition no worse than would be observed without the Proposed Scheme. In assessing this, the main parameters are considered to be the overall network performance and queues and journey times at those key nodes. The following package of mitigation is proposed in Table 8-209.

Table 8-209: Highway mitigation works

New/modified highway or junction	Description
M42 junction 6 (Figure 8-14)	A segregated left turn lane for A45 westbound to M42 southbound is provided, requiring retaining walls and a widened earthwork cutting to support the widening. The existing access to the National Motorcycle Museum is closed with a replacement access provided approximately 300m to the east on the A45 westbound service road. This also requires a permanent footpath diversion (FP M107). The M42 northbound off slip roundabout entry widened to four lanes The A45 eastbound off slip roundabout entry widened to 4 lanes, requiring a retaining wall and a widened earthwork embankment to support the widening The M42 southbound off slip roundabout entry widened to four lanes requiring a widened earthwork embankment to support the widening. The roundabout circulatory widened to five lanes between the M42 northbound off slip and the M42 northbound on slip, with the existing bridge over the A45 widened. The roundabout circulatory widened to four lanes between the A45 westbound off slip and the M42 southbound on slip
Stonebridge Island (see Figure 8-16)	Signalisation of the junction and segregated left turn lanes are provided for: - A452 Kenilworth Road to A45(T) westbound with the associated entry slip widened to three lanes requiring a widened earthwork cutting to support the widening. -A45(T) eastbound to A452(T) Chester Road northbound requiring a widened earthwork cutting to support the widening and the pub access to be realigned. -A452(T) Chester Road southbound to A45 eastbound requiring a widened earthwork embankment to support the widening. A right turn for the A452(T) Chester Road southbound to A45(T) westbound is provided by a new link through the centre of the existing junction with the junction approach arms becoming signalised as a result.
M6 junction 4 (see Figure 8-15)	Signalisation of the junction. The M6 westbound off slip would be widened to three lanes requiring a retaining wall and widened earthwork embankment to support the widening. The A446(T) Stonebridge Road northbound approach would be widened to three lanes between the existing merge from the A452 Chester Road and M6 junction 4. The additional lane would be constructed in the existing A446(T) central reserve. The M6 eastbound off slip would be widened to three lanes required widened earthworks embankment to support the widening. The A446 Stonebridge Road southbound approach would be widened to three lanes between the Coleshill Heath Road roundabout and M6 junction 4. The additional lane would be constructed in the existing A446 central reserve. The roundabout circulatory widened to four lanes between the A446(T) northbound approach and the M6 westbound on slip. The existing bridge over the M6 westbound to M42 southbound slip is also widened. The remainder of the roundabout circulatory is widened to three lanes using the existing bridges.

Figure 8-14: Proposed mitigation to M42 junction 6

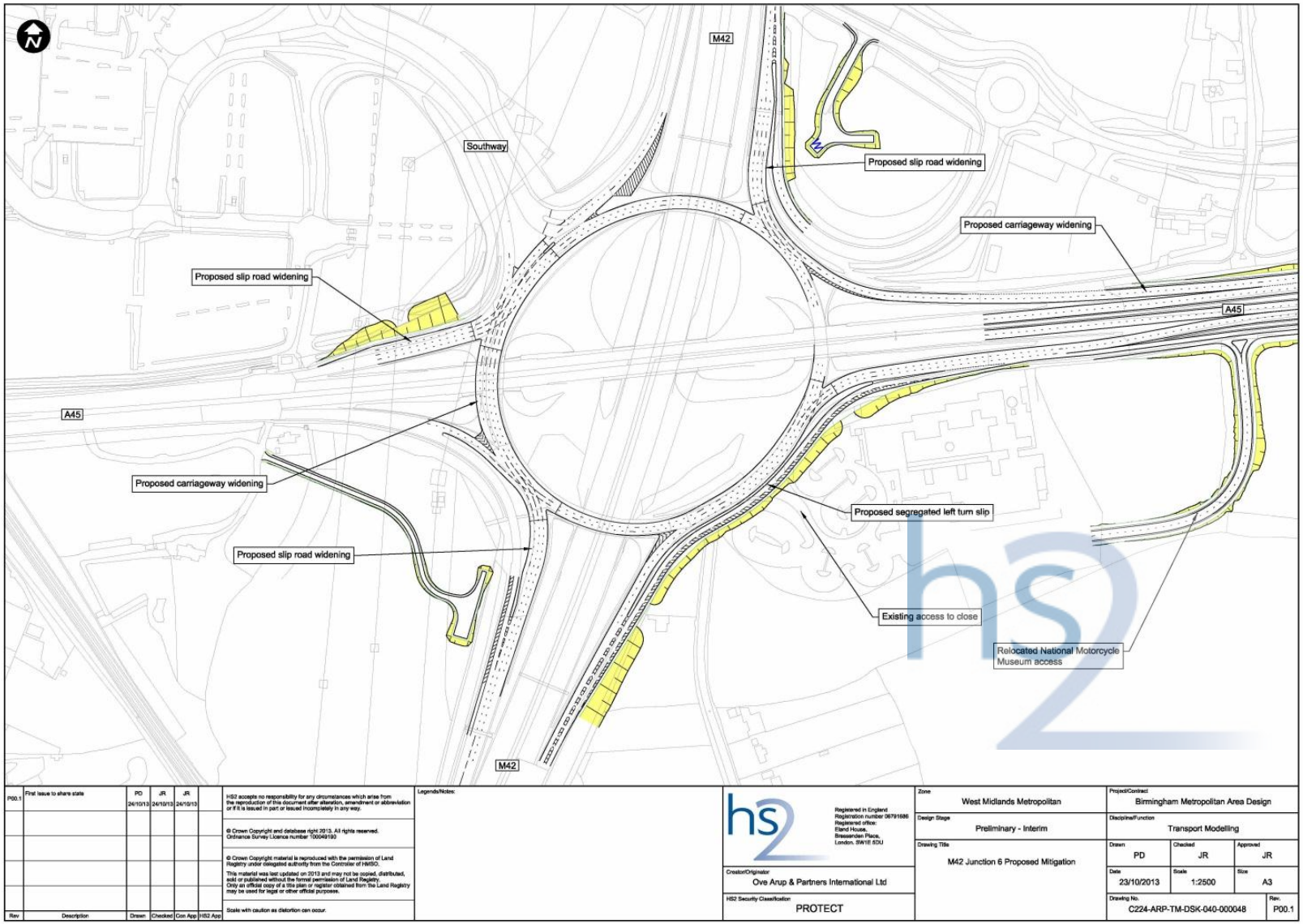


Figure 8-15: Proposed mitigation to M6 junction 4

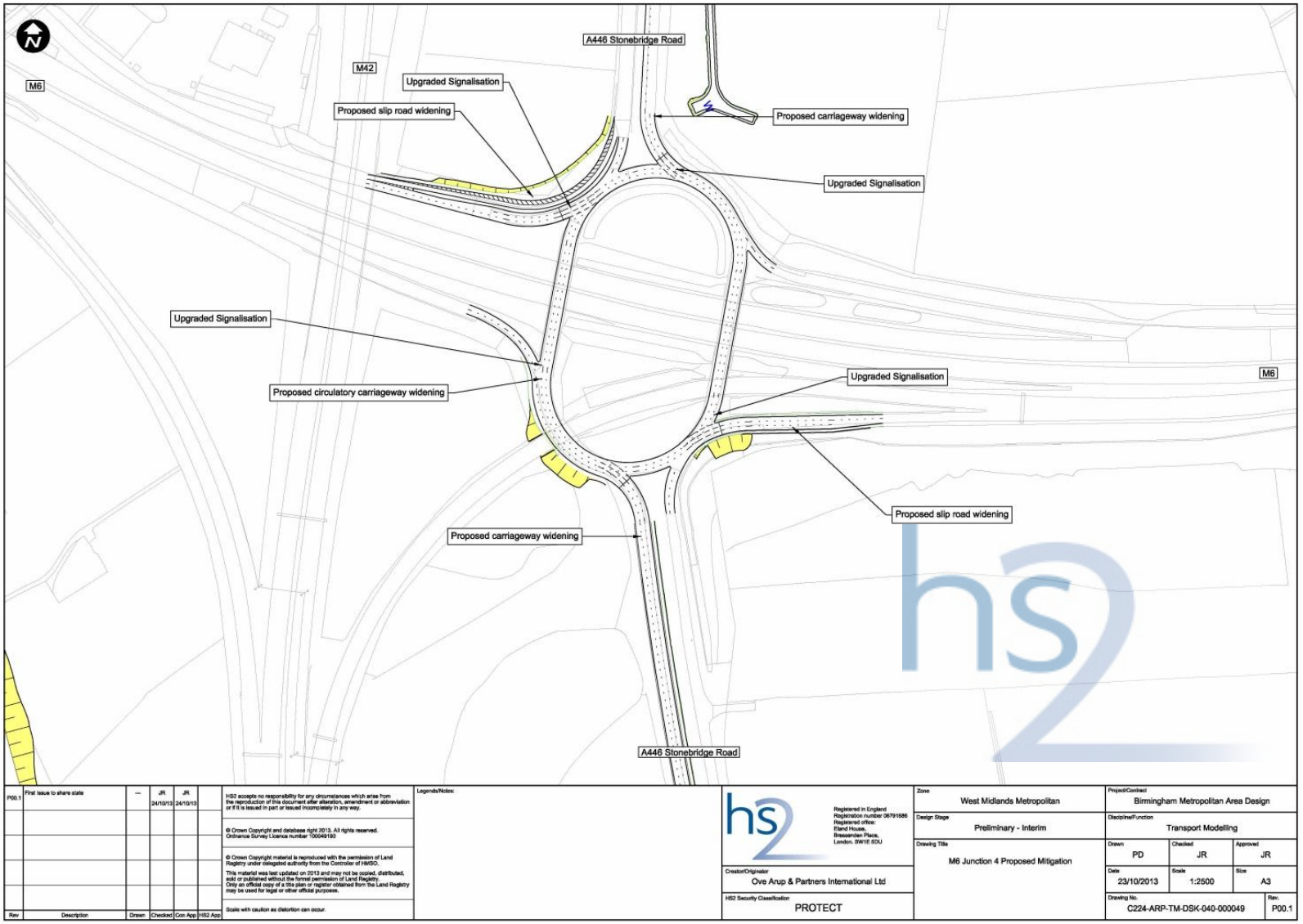
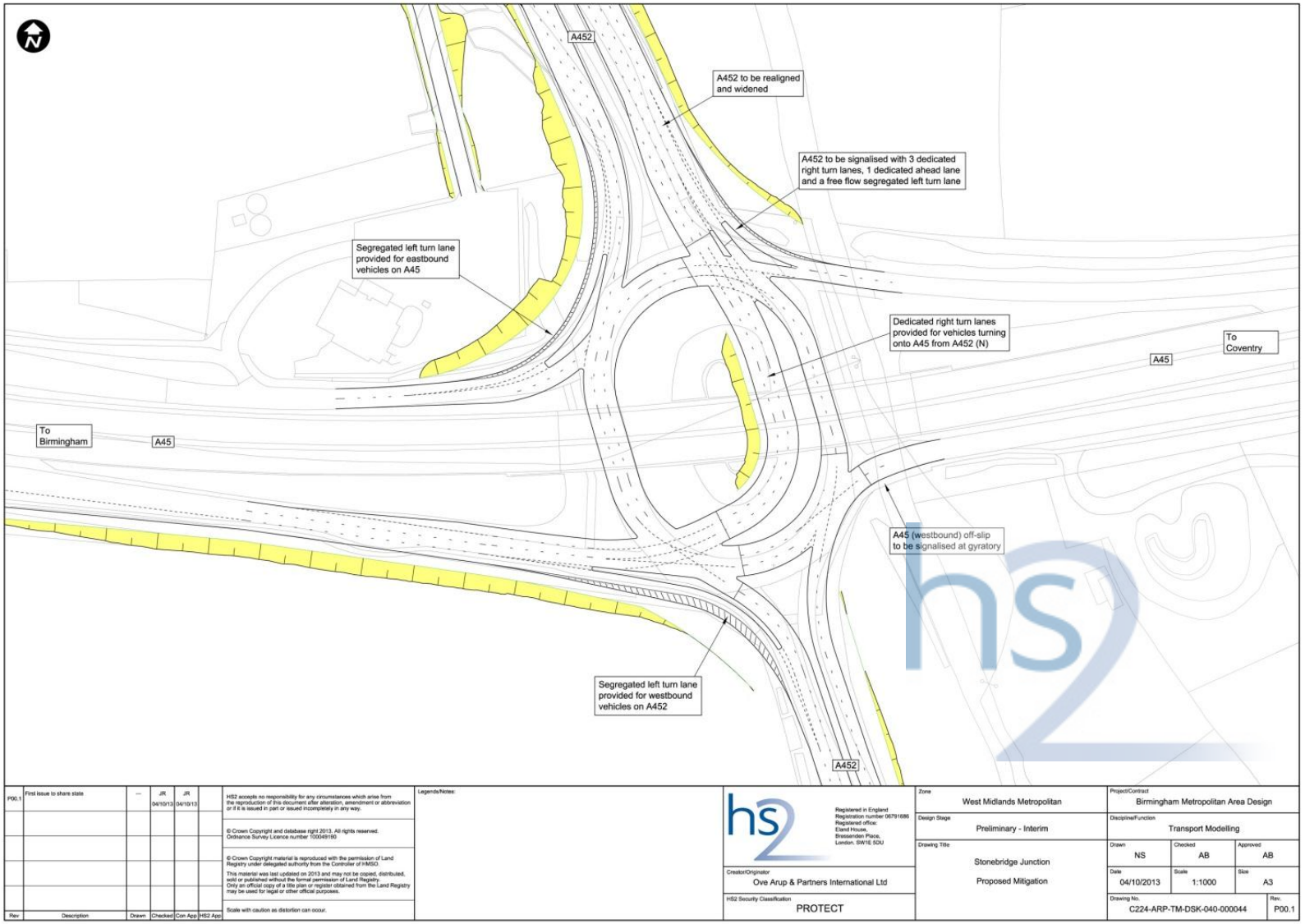


Figure 8-16: Proposed mitigation to Stonebridge Island



8.4.483 In addition to the above physical mitigation, optimisation of the signal timings at A45 Coventry Road/Damson Parkway is proposed. The impact of the above package of mitigation measures has been assessed using the Birmingham Interchange VISSIM model and is considered below.

8.4.484 The proposed mitigation will also require changes to PRoW FP M107 and footways around M42 junction. Table 8-210 summarises these changes.

Table 8-210: Permanent PRoW diversion as a result of proposed mitigation

PRoW	Length of diversion	Reason for diversion
Footpath M107 (temporary during construction) (see CT-05-106-L1, Volume 2, Map Book 24)	450m	Temporary diversion of Footpath M107, approximately 200m south of the existing footpath alignment. Required whilst the widening works associated with the A45 Coventry Road/M42 junction 6 roundabout are being undertaken Approximate duration: 12 months
Footpath M107 (temporary during construction) (see CT-05-106-L1, Volume 2, Map Book 24)	200m	Temporary local diversion offset up to 50m parallel with current alignment. Required for the widening works associated with the A45 Coventry Road/M42 junction 6 roundabout and construction of new balancing pond and turning head. Approximate duration: 12 months
Footpath M107 (permanent) (see CT-06-106-L1, Volume 2, Map Book 24)	200m	Permanent realignment of Footpath M107 for approximately 200m to the east of the new access for the National Motorcycle Museum. Adds an additional 20m to route. To be done prior to works start on new access road to avoid temporary footpath diversion.
Footpath M107 (permanent) (see CT-06-106-L1, Volume 2, Map Book 24)	200m	Permanent diversion of Footpath M107 on the western side of the M42. Required for the widening works associated with the A45 Coventry Road/M42 junction 6 roundabout.

Network Modelling 2026

8.4.485 This section considers the impact of the proposed mitigation measures on the highway network in 2026. The Birmingham Interchange VISSIM model, described earlier in the report has been used to assess the changes in network conditions as a result of trips to and from Birmingham Interchange station.

Network performance

8.4.486 Table 8-211 summarises the performance of the network in 2026 without the Proposed Scheme (future baseline) and with Proposed Scheme but not including any highway mitigation as well as with Proposed Scheme and with the proposed mitigation to address the additional trips for the AM peak hour.

Table 8-211: Birmingham Interchange area VISSIM model 2026 AM peak hour network performance indicators - future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

Parameter	AM peak (08:00-09:00)		
	future baseline	Proposed Scheme (no mitigation)	Proposed Scheme (with mitigation)
Average delay time per vehicle [s], All Vehicle Types	74.8	120.5	77.4
Average number of stops per vehicles, All Vehicle Types	1	3	1
Average speed [mph], All Vehicle Types	37.7	33.5	37.8
Average stopped delay per vehicle [s], All Vehicle Types	15	27	16
Total delay time [h], All Vehicle Types	760	1271	824
Total Distance Travelled [km], All Vehicles	215714	229017	235872
Number of Stops, All Vehicle Types	52061	101042	55870
Number of vehicles in the network, All Vehicle Types	3663	4695	4060
Number of vehicles that have left the network, All Vehicle Types	32915	33278	34264
Total stopped delay [h], All Vehicle Types	156	284	169
Total travel time [h], All Vehicle Types	3558	4245	3875
Unreleased Vehicles	158	439	24

8.4.487 The table shows that with the mitigation in place, the overall performance of the network is substantially improved with average delays broadly in line with 2026 future baseline conditions and vehicle speeds similar to those modelled in the 2026 future baseline. It should also be noted that total throughput of the network increases by 4.7% and the proportion of unreleased vehicles reduces from 0.4% in the future baseline to 0.1% with Proposed Scheme (with mitigation). Table 8-212 summarises the locations at which vehicles are unreleased in 2026 future baseline and with Proposed Scheme (no mitigation) scenarios in the AM peak hour.

Table 8-212: Birmingham Interchange Area VISSIM Model AM Peak Hour Unreleased Vehicles - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

AM peak	2041 future baseline		2041 with Proposed Scheme (no mitigation)		2041 with Proposed Scheme (with mitigation)	
	Unreleased vehicles	Proportion of demand	Unreleased vehicles	Proportion of demand	Unreleased vehicles	Proportion of demand
A45 Coventry Rd west of Damson Parkway (EB)	617	23.90%	849	30.90%	491	17.85%
M6 east	609	12.90%	775	16.20%	367	7.67%
Stonebridge Rd north (SB)	69	4.10%	225	12.80%	-	-

AM peak	2041 future baseline		2041 with Proposed Scheme (no mitigation)		2041 with Proposed Scheme (with mitigation)	
	Unreleased vehicles	Proportion of demand	Unreleased vehicles	Proportion of demand	Unreleased vehicles	Proportion of demand
Chester Road north (SB)	20	1.30%	523	31.40%	402	24.20%
Chelmsley Road	-	0.00%	-	-	-	-
M42 north (SB)	610	9.10%	1829	27.10%	575	8.52%
Damson Parkway	-	-	131	14.40%	-	-
Catherine De Barnes Lane	-	-	1	0.10%	1	0.13%
M42 south (NB)	-	-	1172	16.00%	-	-
M6 west	-	-	141	3.50%	79	1.97%

8.4.488 Table 8-212 shows the proposed mitigation substantially reduces the impact of unreleased vehicles.

8.4.489 Table 8-213 summarises the performance of the network for the PM peak hour.

Table 8-213: Birmingham Interchange area VISSIM model PM peak hour network performance indicators - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

Parameter	PM peak (17:00-18:00)		
	Future baseline	Proposed Scheme (no mitigation)	Proposed Scheme (with mitigation)
Average delay time per vehicle [s], All Vehicle Types	87.9	279.1	70.4
Average number of stops per vehicles, All Vehicle Types	2	8.7	1.2
Average speed [mph], All Vehicle Types	37.0	22.6	38.4
Average stopped delay per vehicle [s], All Vehicle Types	23	111	12
Total delay time [h], All Vehicle Types	980	3164	842
Total Distance Travelled [km], All Vehicle Types	241202	214945	256733
Number of Stops, All Vehicle Types	92882	356388	53157
Number of vehicles in the network, All Vehicle Types	4603	8399	4278
Number of vehicles that have left the network, All Vehicle Types	35515	32650	38770
Total stopped delay [h], All Vehicle Types	260	1249	148
Total travel time [h], All Vehicle Types	4047	5952	4155
Unreleased Vehicles	601	3196	147

8.4.490 Table 8-213 shows that with the mitigation in place, the overall performance of the network is substantially improved with average delays and vehicle speeds better than those modelled in the 2026 future baseline. It should also be noted that total throughput of the network increases by 7.3% and the proportion of unreleased vehicles reduces from 1.5% in the future baseline to 0.3% with Proposed Scheme (with mitigation). Table 8-214 summarises the locations at which vehicles are unreleased in 2026 future baseline and with Proposed Scheme (no mitigation) scenarios in the PM peak hour.

Table 8-214: Birmingham Interchange Area VISSIM model PM peak hour unreleased vehicles - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

Location	2026 future baseline		2026 with Proposed Scheme (no mitigation)		2026 with Proposed Scheme (with mitigation)	
	Unreleased vehicles	Proportion of demand	Unreleased vehicles	Proportion of demand	Unreleased vehicles	Proportion of demand
A45 Coventry Rd west of Damson Parkway (EB)	-	-	605	24.80%	85	3.49%
Damson Parkway	29	3.90%	755	6.40%	-	-
Terminal Road	-	-	18	5.90%	-	-
Catherine-de-Barnes Lane	-	-	2	0.40%	2	0.36%
M42 south (NB)	494	7.40%	800	11.70%	-	-
A452 Kenilworth Road (NB)	-	-	101	8.90%	-	-
A45 Birmingham Road east (WB)	-	-	412	14.90%	-	-
Starlet Way	-	-	123	31.80%	-	-
Elmdon Trading Estate	-	-	53	26.10%	-	-
Airport Way (Long Stay Car Park)	-	-	237	30.80%	-	-
Viking Way (Long Stay Car Park)	-	-	41	27.70%	-	-
Station Link Road	-	-	325	36.60%	-	-
Solihull Business Park	320	21.50%	-	-	-	-
Motorcycle Museum Exit	76	74.20%	29	27.20%	-	-
M42 north (SB)	1	0.00%	983	15.10%	35	0.53%
Coleshill Road	-	-	33	8.30%	-	-
Harbet Drive	-	-	27	24.90%	-	-
Perimeter Road	-	-	47	26.60%	-	-
M6 east	-	-	323	8.00%	1	0.02%

8.4.491 Table 8-214 shows the proposed mitigation substantially reduces the impact of unreleased vehicles.

Junction Performance 2026

M42 junction 6

8.4.492 Table 8-215 shows the flow and maximum queues at M42 junction 6 in the weekday AM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-215: M42 junction 6 AM peak hour queue lengths (metres) - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

M42 junction 6	AM peak (08:00-09:00)					
	2026 future baseline		2026 with Proposed Scheme (no mitigation)		2026 with Proposed Scheme (with mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue	Flow (veh)	Max queue
M42 north off-slip	1774	88	1662	82	1788	151
A45 Coventry Road east off-slip	1357	127	1450	122	1348	45
National Motorcycle Museum*	n/a	n/a	n/a	n/a	n/a	n/a
M42 south off-slip	2328	143	2667	145	2717	105
A45 Coventry Road west off-slip	1648	94	1558	91	1518	81
south Way - Left Turn	464	45	350	54	533	64
south Way - Ahead		62		67		64

8.4.493 Table 8-216 below shows the flow and maximum queues at M42 junction 6 in the weekday PM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-216: M42 junction 6 PM peak hour queue lengths (metres) - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

M42 junction 6	PM peak (17:00-18:00)					
	2026 future baseline		2026 with Proposed Scheme (no mitigation)		2026 with Proposed Scheme (with mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue	Flow (veh)	Max queue
M42 north off-slip	1742	485	1560	4902	1809	122
A45 Coventry Road east off-slip	2025	1156	1248	4008	2305	76
National Motorcycle Museum*	n/a	n/a	n/a	n/a	n/a	n/a
M42 south off-slip	1746	3076	1716	3041	2293	108
A45 Coventry Road west off-slip	2200	135	2163	2015	2637	142
south Way - Left Turn	554	58	422	1041	935	86
south Way - Ahead		68		1049		95

8.4.494 Table 8-215 and Table 8-216 above show that the proposed mitigation provides substantial benefits particularly in the PM peak hour with maximum queues reduced substantially. In the future baseline queues were forecast to extend back to the mainline of the M42. The proposed mitigation reduces all queues to within the available off-slip capacity. The mitigation has little impact on the AM peak although overall conditions in the AM peak were not considered to be an issue even without mitigation.

8.4.495 Table 8-217 below considers the operation of M42 junction 6 in terms of average journey times/delays and junction throughput the weekday AM peak hour.

Table 8-217: M42 junction 6 AM peak hour average journey times (seconds) and throughput - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

M42 junction 6	AM peak (08:00-09:00)		
	2026 future baseline	2026 with Proposed Scheme (no mitigation)	2026 with Proposed Scheme (with mitigation)
junction Throughput (vehicles)	7571	7687	7904
Average Travel Time per Vehicle (seconds)	92	82	77

8.4.496 Table 8-218 below shows the operation of M42 junction 6 in terms of average journey times/delays and junction throughput the weekday PM peak hour.

Table 8-218: M42 junction 6 PM peak hour average journey times (seconds) and throughput - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

M42 junction 6	PM peak (17:00-18:00)		
	2026 future baseline	2026 with Proposed Scheme (no mitigation)	2026 with Proposed Scheme (with mitigation)
junction Throughput (vehicles)	8261	6771	9979
Average Travel Time per Vehicle (seconds)	137	215	82

8.4.497 Table 8-217 and Table 8-218 above show that the proposed mitigation provides a substantial improvement in both the AM and PM peak hours. Both average journey times improve and junction throughput increases by almost 5% in the AM peak hour and 21% in the PM peak hour compared to the future baseline.

M6 junction 4

8.4.498 Table 8-219 below shows the flow and maximum queues at M6 junction 4 in the weekday AM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-219: M6 junction 4 AM peak hour queue lengths (metres) - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

M6 junction 4	AM peak (08:00-09:00)					
	2026 future baseline		2026 with Proposed Scheme (no mitigation)		2026 with Proposed Scheme (with mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue	Flow (veh)	Max queue
A446 Stonebridge Road (north)	1200	382	1158	275	1494	101
M6 east off-slip	699	136	673	1177	760	111
A446 Stonebridge Road (south)	1213	35	1006	30	1103	74
M6 west off-slip	1401	161	1509	95	1508	108

8.4.499 Table 8-220 below shows the flow and maximum queues at M6 junction 4 in the weekday PM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-220: M6 junction 4 PM peak hour queue lengths (metres) - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

M6 junction 4	PM peak (17:00-18:00)					
	2026 future baseline		2026 with Proposed Scheme (no mitigation)		2026 with Proposed Scheme (with mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue	Flow (veh)	Max queue
A446 Stonebridge Road (north)	1192	73	1345	362	1265	106
M6 east off-slip	504	66	360	51	507	83
A446 Stonebridge Road (south)	1843	105	1903	195	2404	159
M6 west off-slip	1221	149	1291	830	1290	84

8.4.500 Table 8-219 and Table 8-220 above show that the proposed mitigation provides substantial improvements to the operation of the junction in both the AM and PM peak hours With the mitigation, the total queues across the junction are less than the future baseline in the AM peak hour, and similar in the PM peak hour.

8.4.501 Table 8-221 below considers the operation of M6 junction 4 in terms of average journey times/delays and junction throughput the weekday AM peak hour.

Table 8-221: M6 junction 4 AM peak hour average journey times (seconds) and throughput - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation)

M6 junction 4	AM peak		
	2026 future baseline	2026 with Proposed Scheme (no mitigation)	2026 with Proposed Scheme (with mitigation)
junction Throughput (vehicles)	4513	4346	4865
Average Travel Time per Vehicle (seconds)	45	43	50

8.4.502 Table 8-222 below shows the operation of M6 junction 4 in terms of average journey times/delays and junction throughput the weekday PM peak hour.

Table 8-222: M6 junction 4 PM peak hour average journey times (seconds) and throughput - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

M6 junction 4	PM peak		
	2026 future baseline	2026 with Proposed Scheme (no mitigation)	2026 with Proposed Scheme (with mitigation)
junction Throughput (vehicles)	4760	4898	5466
Average Travel Time per Vehicle (seconds)	45	57	45

8.4.503 Table 8-221 and Table 8-222 above show that the proposed mitigation substantially improves throughput with minimal impact on journey times. Throughput in the AM peak hour is increased by 8% and in the PM peak by around 15% when compared to the future baseline.

Stonebridge Island

8.4.504 Table 8-223 below shows the flow and maximum queues at Stonebridge Island in the weekday AM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-223: Stonebridge Island AM peak hour queue lengths (metres) - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

Stonebridge Island	AM peak (08:00-09:00)					
	2026 future baseline		2026 with Proposed Scheme (no mitigation)		2026 with Proposed Scheme (with mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue	Flow (veh)	Max queue
A452 Chester Road	2080	330	2322	586	2353	88
A45 east off-slip	272	102	256	134	734	90
A452 Kenilworth Road	1185	76	1356	163	914	79
A45 west off-slip - left turn	1409	154	1545	410	2083	0
A45 west off-slip - ahead		175		396		56

8.4.505 Table 8-224 below shows the flow and maximum queues at Stonebridge Island in the weekday PM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-224: Stonebridge Island PM peak hour queue lengths (metres) - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

Stonebridge Island	PM peak (17:00-18:00)					
	2026 future baseline		2026 with Proposed Scheme (no mitigation)		2026 with Proposed Scheme (with mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue	Flow (veh)	Max queue
A452 Chester Road	2308	317	2018	1765	3028	69
A45 east off-slip	292	61	259	1348	681	61
A452 Kenilworth Road	1115	74	863	1801	970	178
A45 west off-slip - left turn	1183	147	1217	284	1060	0
A45 west off-slip - ahead		142		279		53

8.4.506 Table 8-223 and Table 8-224 above show that the proposed mitigation measures substantially reduce queues at the junction in both the AM and PM peak hours with no queues extending back and impacting on the mainline of the A45 Coventry Road.

8.4.507 Table 8-225 below considers the operation of Stonebridge Island in terms of average journey times/delays and junction throughput the weekday AM peak hour.

Table 8-225: Stonebridge Island AM peak hour average journey times (seconds) and throughput - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

Stonebridge Island	AM peak (08:00-09:00)		
	2026 future baseline	2026 with Proposed Scheme (no mitigation)	2026 with Proposed Scheme (with mitigation)
junction Throughput (vehicles)	4946	5479	6085
Average Travel Time per Vehicle (seconds)	56	74	53

8.4.508 Table 8-226 below shows the operation of Stonebridge Island in terms of average journey times/delays and junction throughput the weekday PM peak hour.

Table 8-226: Stonebridge Island PM peak hour average journey times (seconds) and throughput - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

Stonebridge Island	PM peak (17:00-18:00)		
	2026 future baseline	2026 with Proposed Scheme (no mitigation)	2026 with Proposed Scheme (with mitigation)
junction Throughput (vehicles)	4897	4356	5738
Average Travel Time per Vehicle (seconds)	49	116	58

8.4.509 Table 8-225 and Table 8-226 above show that the proposed mitigation substantially improves throughput with minimal impact on journey times. Throughput in the AM peak hour is increased by 23% and in the PM peak by around 18%.

A45 Coventry Road/Damson Parkway

8.4.510 Table 8-227 below shows the flow and maximum queues at the A45 Coventry Road/Damson Parkway traffic signal junction in the weekday AM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-227: A45 Coventry Road/Damson Parkway AM peak hour queue lengths (metres) - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

A45 Coventry Road/Damson Parkway	AM peak (08:00-09:00)					
	2026 future baseline		2026 with Proposed Scheme (no mitigation)		2026 with Proposed Scheme (with mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue	Flow (veh)	Max queue
Terminal Road - Left Turn	188	99	189	79	190	54
Terminal Road - Ahead/ Right Turn		101		74		55
A45 Coventry Road (east) - Ahead	2136	126	2150	136	2183	112
A45 Coventry Road (east) - Right Turn		53		46		57
Damson Parkway - Left Turn	722	34	762	32	820	33
Damson Parkway - Ahead/Right Turn		280		615		252
A45 Coventry Road (west) - Ahead	1979	1001	1966	1003	2211	999
A45 Coventry Road (west) - Right Turn		69		54		273

8.4.511 Table 8-228 below shows the flow and maximum queues at in the weekday PM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-228: A45 Coventry Road/Damson Parkway PM peak hour queue lengths (metres) - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

A45 Coventry Road/Damson Parkway	PM peak (17:00-18:00)					
	2026 future baseline		2026 with Proposed Scheme (no mitigation)		2026 with Proposed Scheme (with mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue	Flow (veh)	Max queue
Terminal Road - Left Turn	268	161	252	196	304	74
Terminal Road - Ahead/ Right Turn		163		198		76
A45 Coventry Road (east) - Ahead	2710	334	2390	419	3071	222
A45 Coventry Road (east) - Right Turn		84		67		49
Damson Parkway - Left Turn	674	46	675	50	753	29
Damson Parkway - Ahead/Right Turn		644		646		114

A45 Coventry Road/Damson Parkway	PM peak (17:00-18:00)					
	2026 future baseline		2026 with Proposed Scheme (no mitigation)		2026 with Proposed Scheme (with mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue	Flow (veh)	Max queue
A45 Coventry Road (west) - Ahead	2339	451	2310	1000	2207	1006
A45 Coventry Road (west) - Right Turn		159		382		288

8.4.512 Table 8-227 and Table 8-228 show that the proposed mitigation results in the total queues across the junction being of a similar magnitude to the future baseline in the AM and PM peak hours. In the PM peak hour, there is some redistribution of queues from Damson Parkway (in the future baseline) to the A45 Coventry Road west approach (with the Proposed Scheme and mitigation).

8.4.513 Table 8-229 below considers the operation of the A45 Coventry Road/Damson Parkway traffic signal junction in terms of average journey times/delays and junction throughput the weekday AM peak hour.

Table 8-229: A45 Coventry Road/Damson Parkway AM peak hour average journey times (seconds) and throughput - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

A45 Coventry Road/Damson Parkway	AM peak		
	2026 future baseline	2026 with Proposed Scheme (no mitigation)	2026 with Proposed Scheme (with mitigation)
junction Throughput (vehicles)	5025	5066	5404
Average Travel Time per Vehicle (seconds)	68	78	58

8.4.514 Table 8-230 below shows the operation of the A45 Coventry Road/Damson Parkway traffic signal junction in terms of average journey times/delays and junction throughput the weekday PM peak hour.

Table 8-230: A45 Coventry Road/Damson Parkway PM peak hour average journey times (seconds) and throughput - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

A45 Coventry Road/Damson Parkway	PM peak		
	2026 future baseline	2026 with Proposed Scheme (no mitigation)	2026 with Proposed Scheme (with mitigation)
junction Throughput (vehicles)	5990	5627	6336
Average Travel Time per Vehicle (seconds)	64	90	56

8.4.515 Table 8-229 and Table 8-230 above show that the proposed mitigation substantially improves throughput and journey times. Throughput in the AM peak hour is increased by 8% and in the PM peak by around 6% while journey times improve in both peak hours.

8.4.516 The proposed mitigation is shown to improve the throughput of the key junctions in 2026 without any substantial adverse impact on journey times and/or queues.

8.4.517 The following sections consider the knock-on impact on the other main junctions in the network as well as route travel times.

A452 Chester Road/B4438 Bickenhill Parkway

8.4.518 Table 8-231 below shows the flow and maximum queues at the A452 Chester Road/B4438 Bickenhill Parkway roundabout junction (Birmingham Business Park) in the weekday AM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-231: A452 Chester Road/B4438 Bickenhill Parkway AM peak hour queue lengths (metres) - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

A452 Chester Road/B4438 Bickenhill Parkway	AM peak (08:00-09:00)					
	2026 future baseline		2026 with Proposed Scheme (no mitigation)		2026 with Proposed Scheme (with mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue	Flow (veh)	Max queue
A446 north slips	955	105	n/a	n/a	n/a	n/a
A452 Chester Road south	768	188	n/a	n/a	n/a	n/a
B4438 Bickenhill Parkway	308	111	434	42	637	87
Solihull Parkway	136	10	136	15	135	21
A452 Chester Road north	1245	30	1166	0	1323	8

8.4.519 Table 8-232 below shows the flow and maximum queues at in the weekday PM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-232: A452 Chester Road/B4438 Bickenhill Parkway PM peak hour queue lengths (metres) - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

A452 Chester Road/B4438 Bickenhill Parkway	PM peak (17:00-18:00)					
	2026 future baseline		2026 with Proposed Scheme (no mitigation)		2026 with Proposed Scheme (with mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue	Flow (veh)	Max queue
A446 north slips	170	22	n/a	n/a	n/a	n/a
A452 Chester Road south	616	75	n/a	n/a	n/a	n/a
B4438 Bickenhill Parkway	442	24	414	11	413	25
Solihull Parkway	1479	184	1493	51	1481	159
A452 Chester Road north	945	380	791	95	997	447

8.4.520 Table 8-231 and Table 8-232 above show the proposed mitigation has no substantial impacts on the junction compared to the future baseline in both the AM and PM peak hours.

8.4.521 As noted above the existing roundabout junction is replaced by a series of three roundabout junctions and associated link roads. Table 8-233 and Table 8-234 summarise the queue results for the two further new junctions which are not included in the tables above.

Table 8-233: B4438 Bickenhill Parkway/Northway peak hour queue lengths (metres) - 2026 with (with mitigation)

B4438 Bickenhill Parkway/Northway roundabout	**AM peak (08:00-09:00)**	**PM peak (17:00-18:00)**
	Max queue	**Max queue**
B4438 (north)	87	64
New Link from Interchange Roundabout	157	14
Northway	84	42
B4438 (south)	40	34

Table 8-234: New Proposed Scheme Birmingham Interchange Access/A446 Links/A452 links peak hour queue lengths (metres) - 2026 with Hs2 (with mitigation)

Proposed Scheme Birmingham Interchange Access roundabout	**AM peak (08:00-09:00)**	**PM peak (17:00-18:00)**
	Max queue	**Max queue**
A446 Link Road (north)	72	31
A452 Link Road (south)	78	0
Proposed Scheme Egress 1	8	1
Proposed Scheme Egress 2	2	4
A452 Link Road (north)	15	40

8.4.522 Table 8-233 and Table 8-234 above show that the new roundabout junctions operate with little or no queue related problems.

8.4.523 Table 8-235 below considers the operation of the network of three junctions compared with the existing A452 Chester Road/B4438 Bickenhill Parkway roundabout junction in terms of average journey times/delays and junction throughput the weekday AM peak hour.

Table 8-235: A452 Chester Road/B4438 Bickenhill Parkway AM peak hour average journey times (seconds) and throughput - 2012, 2026, 2041 future baseline (no Proposed Scheme) vs Proposed Scheme (with mitigation)

A452 Chester Road/B4438 Bickenhill Parkway	**AM peak**		
	2026 future baseline	**2026 with Proposed Scheme (no mitigation)**	**2026 with Proposed Scheme (with mitigation)**
junction Throughput (vehicles)	3854	4269	4907
Average Travel Time per Vehicle (seconds)	71	106	94

8.4.524 Table 8-236 below shows the operation of the network of three junctions compared with the existing A452 Chester Road/B4438 Bickenhill Parkway roundabout junction in terms of average journey times/delays and junction throughput the weekday PM peak hour.

Table 8-236: A452 Chester Road/B4438 Bickenhill Parkway PM peak hour average journey times (seconds) and throughput - 2012, 2026, 2041 future baseline (no Proposed Scheme) vs Proposed Scheme (with mitigation)

A452 Chester Road/B4438 Bickenhill Parkway	**PM peak**		
	2026 future baseline	**2026 with Proposed Scheme (no mitigation)**	**2026 with Proposed Scheme (with mitigation)**
junction Throughput (vehicles)	3973	4085	4719
Average Travel Time per Vehicle (seconds)	78	74	73

8.4.525 Table 8-235 and Table 8-236 above show that the proposed mitigation substantially improves the throughput of the junctions. The tables show that the junction throughputs increase by 27% in the AM peak hour and 18% in the PM peak without having a detrimental impact on junction journey times.

A45 Coventry Road/B4438 Catherine-de-Barnes Lane

8.4.526 Table 8-237 below shows the flow and maximum queues at the A45 Coventry Road/B4438 Catherine-de-Barnes Lane roundabout junction in the weekday AM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-237: A45 Coventry Road/B4438 Catherine-de-Barnes Lane AM peak hour queue lengths (metres) - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

A45 Coventry Road/B4438 Catherine-de-Barnes Lane	**AM peak (08:00-09:00)**					
	2026 future baseline		**2026 with Proposed Scheme (no mitigation)**		**2026 with Proposed Scheme (with mitigation)**	
	Flow (veh)	**Max queue**	**Flow (veh)**	**Max queue**	**Flow (veh)**	**Max queue**
B4438 Bickenhill Lane	997	32	1053	35	1000	29
A45 east off-slip	2607	65	2824	118	2615	71
B4438 Catherine De Barnes	715	50	719	47	717	42
A45 west off-slip	1653	15	2057	60	1920	19

8.4.527 Table 8-238 below shows the flow and maximum queues at in the weekday PM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-238: A45 Coventry Road/B4438 Catherine-de-Barnes Lane PM Peak Hour Queue Lengths (metres - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

A45 Coventry Road/B4438 Catherine-de-Barnes Lane	PM peak (17:00-18:00)					
	2026 future baseline		2026 with Proposed Scheme (no mitigation)		2026 with Proposed Scheme (with mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue	Flow (veh)	Max queue
B4438 Bickenhill Lane	2080	14	1928	0	2226	37
A45 east off-slip	2425	163	2028	462	2540	43
B4438 Catherine De Barnes	546	67	559	0	559	47
A45 west off-slip	1937	43	1914	0	1982	13

8.4.528 Table 8-237 and Table 8-238 above show that in both the AM and PM peak hours the proposed mitigation has minimal impact on the performance of the junction when compared to the future baseline.

8.4.529 Table 8-239 below considers the operation of the A45 Coventry Road/B4438 Catherine-de-Barnes Lane roundabout junction in terms of average journey times/delays and junction throughput the weekday AM peak hour.

Table 8-239: A45 Coventry Road/B4438 Catherine-de-Barnes Lane AM peak hour average journey times (seconds) and throughput - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

A45 Coventry Road/B4438 Catherine-de-Barnes Lane	AM peak		
	2026 future baseline	2026 with Proposed Scheme (no mitigation)	2026 with Proposed Scheme (with mitigation)
junction Throughput (vehicles)	5972	6654	6251
Average Travel Time per Vehicle (seconds)	23	24	23

8.4.530 Table 8-240 below shows the operation of the A452 Chester Road/B4438 Bickenhill Parkway roundabout junction in terms of average journey times/delays and junction throughput the weekday PM peak hour.

Table 8-240: A45 Coventry Road/B4438 Catherine-de-Barnes Lane PM peak hour average journey times (seconds) and throughput - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

A45 Coventry Road/B4438 Catherine-de-Barnes Lane	PM peak		
	2026 future baseline	2026 with Proposed Scheme (no mitigation)	2026 with Proposed Scheme (with mitigation)
junction Throughput (vehicles)	6988	6428	7307
Average Travel Time per Vehicle (seconds)	22	42	22

8.4.531 Table 8-239 and Table 8-240 above show that there in minimal change average journey times through the junction in the AM or PM peak hours. It is noted that the throughput of the junction decreases with the proposed mitigation. This is as a result of the mitigation on the network making alternative routes more attractive and therefore the route choice of vehicles adjusting in the AM peak. The throughput increase in the PM peak and this is a function of the improved performance of the network at M42 junction 6 and A45 Coventry Road/Damson Parkway releasing demand which was constrained in the future baseline.

A452 Chester Road/Coleshill Heath Road roundabout

8.4.532 Table 8-241 below shows the flow and maximum queues at the A452 Chester Road/Coleshill Heath Road roundabout in the weekday AM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-241: A452 Chester Road/Coleshill Heath Road roundabout AM peak hour queue lengths (metres) - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

A452 Chester Road/Coleshill Heath Road	AM peak (08:00-09:00)					
	2026 future baseline		2026 with Proposed Scheme (no mitigation)		2026 with Proposed Scheme (with mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue	Flow (veh)	Max queue
Coleshill Heath Road (north)	407	421	687	1323	605	1050
Chester Road (east)	777	75	640	43	988	54
Coleshill Heath Road (south)	530	77	680	161	454	107
Chester Road (west)	1371	377	1069	1299	1211	1320

8.4.533 Table 8-242 below shows the flow and maximum queues at in the weekday PM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-242: A452 Chester Road/Coleshill Heath Road PM peak hour queue lengths (metres) - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

A452 Chester Road/Coleshill Heath Road	PM peak (17:00-18:00)					
	2026 future baseline		2026 with Proposed Scheme (no mitigation)		2026 with Proposed Scheme (with mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue	Flow (veh)	Max queue
Coleshill Heath Road (north)	787	217	951	645	813	354
A452 Chester Road (east)	1439	149	1160	767	1581	509
Coleshill Heath Road (south)	328	122	484	384	376	142
A452 Chester Road (west)	872	74	904	28	916	156

8.4.534 Table 8-241 and Table 8-242 above show that queues are forecast to increase in both the AM and PM peak hours relative to the future baseline although the proposed mitigation does result in some reduction when compared to the no mitigation scenario. As explained earlier, this is associated with traffic re-routing due to a combination of wider network congestion and existing A452 Chester Road/B4438 Bickenhill Parkway roundabout being replaced by the three new junctions which increase journey distances on alternative routes. As a result, the model indicates that some traffic will reroute via Coleshill Heath Road and thereby having an impact on the A452 Chester Road/Coleshill Heath Road roundabout. It should also be noted that the proposed mitigation also improves total throughput of the junction. Potential highway improvements (within the highway boundary) to manage the flow of traffic on Coleshill Heath Road will be discussed with the highway authorities. Any potential mitigation scheme has not been taken into account in the assessment but would help mitigate the Proposed Scheme impacts.

8.4.535 Table 8-243 below considers the operation of A452 Chester Road/Coleshill Heath Road roundabout junction in terms of average journey times/delays and junction throughput the weekday AM peak hour.

Table 8-243: A452 Chester Road/Coleshill Heath Road AM peak hour average journey times (seconds) and throughput - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

A452 Chester Road/Coleshill Heath Road	**AM peak**		
	2026 future baseline	**2026 with Proposed Scheme (no mitigation)**	**2026 with Proposed Scheme (with mitigation)**
junction Throughput (vehicles)	3085	3076	3257
Average Travel Time per Vehicle (seconds)	63	164	123

8.4.536 Table 8-244 below shows the operation of the A452 Chester Road/Coleshill Heath Road roundabout junction in terms of average journey times/delays and junction throughput the weekday PM peak hour.

Table 8-244: A452 Chester Road/Coleshill Heath Road PM peak hour average journey times (seconds) and throughput - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

A452 Chester Road/Coleshill Heath Road	**PM peak**		
	2026 future baseline	**2026 with Proposed Scheme (no mitigation)**	**2026 with Proposed Scheme (with mitigation)**
junction Throughput (vehicles)	3425	3499	3687
Average Travel Time per Vehicle (seconds)	39	61	50

8.4.537 Table 8-243 and Table 8-244 above show that whilst average journey times through junction increase in the AM and PM peak hours, the increase is reduced with the proposed mitigation in place. The mitigation also improves junction throughput by 6% in the AM peak hour and 8% in the PM peak hour.

Route travel times 2026

M42 junction 6-J7

8.4.538 Table 8-245 below summarises the change in journey times on the M42 in the weekday AM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-245: M42 travel time AM peak hour (seconds) - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

AM peak (08:00-09:00)	2026 future baseline	2026 with Proposed Scheme (no mitigation)	2026 with Proposed Scheme (with mitigation)
northbound	299	318	298
southbound	321	332	317

8.4.539 Table 8-246 below summarises the change in journey times on the M42 in the weekday PM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-246: M42 travel time PM peak hour (seconds) - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

PM peak (17:00-18:00)	2026 future baseline	2026 with Proposed Scheme (no mitigation)	2026 with Proposed Scheme (with mitigation)
northbound	353	395	344
southbound	311	420	319

8.4.540 Table 8-245 and Table 8-246 above show that with the proposed mitigation travel times on the M42 similar to the future baseline in both the AM and PM peak hours.

A45 Coventry Road between Goodway Road and Shepherds Lane

8.4.541 Table 8-247 below summarises the change in journey times on the A45 Coventry Road in the weekday AM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-247: A45 Coventry Road travel time AM peak hour (seconds) - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

AM peak (08:00-09:00)	2026 future baseline	2026 with Proposed Scheme (no mitigation)	2026 with Proposed Scheme (with mitigation)
eastbound	483	486	442
westbound	371	373	361

8.4.542 Table 8-248 below summarises the change in journey times on the A45 Coventry Road in the weekday PM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-248: A45 Coventry Road travel time PM peak hour (seconds) - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

PM peak (17:00-18:00)	2026 future baseline	2026 with Proposed Scheme (no mitigation)	2026 with Proposed Scheme (with mitigation)
eastbound	357	518	458
westbound	407	862	377

8.4.543 Table 8-247 and Table 8-248 above show that with the proposed mitigation, average journey times in the AM peak hour on the A45 Coventry Road are a similar to the future baseline. In the PM peak, average journey times in the westbound direction are improved when compared to the future baseline but longer in the eastbound direction. In the context of overall journey travel times, these changes are not expected to be substantial.

A446 between Stonebridge Island and A446 Stonebridge Road/B4117 Coventry Road junction

8.4.544 Table 8-249 below summarises the change in journey times on the A446 in the weekday AM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-249: A446 Stonebridge Road travel time AM peak hour (seconds) - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

AM Peak (08:00-09:00)	2026 future baseline	2026 with Proposed Scheme (no mitigation)	2026 with Proposed Scheme (with mitigation)
northbound	225	230	250
southbound	459	376	258

8.4.545 Table 8-250 below summarises the change in journey times on the A446 in the weekday PM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-250: A446 travel time PM peak hour (seconds) - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

PM peak (17:00-18:00)	2026 future baseline	2026 with Proposed Scheme (no mitigation)	2026 with Proposed Scheme (with mitigation)
northbound	227	237	267
southbound	247	402	258

8.4.546 Table 8-249 and Table 8-250 above show that the proposed mitigation improves travel times in the southbound direction. In overall terms, travel times at not substantially different to the future baseline.

A452 between Cornet's End Roundabout and A452 Chester Road/Coleshill Heath Road Roundabout

8.4.547 Table 8-251 below summarises the change in journey times on the A452 in the weekday AM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-251: A452 travel time AM peak hour (seconds) - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

AM peak (08:00-09:00)	2026 future baseline	2026 with Proposed Scheme (no mitigation)	2026 with Proposed Scheme (with mitigation)
northbound	325	382	376
southbound	348	396	318

8.4.548 Table 8-252 below summarises the change in journey times on the A452 in the weekday PM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-252: A452 travel time PM peak hour (seconds) - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

PM peak (17:00-18:00)	2026 future baseline	2026 with Proposed Scheme (no mitigation)	2026 with Proposed Scheme (with mitigation)
northbound	304	471	443
southbound	380	468	336

8.4.549 Table 8-251 and Table 8-252 above show a similar picture for the A452 Chester Road. The AM peak sees no substantial change in travel times but travel times are increased in the PM peak in the northbound direction. This is likely to be as a result of the improved throughput of the network and longer distances associated with the new three junction arrangements which replace the A452 Chester Road/B4338 Bickenhill Parkway junction.

Network modelling 2041

8.4.550 This section considers the impact of the proposed mitigation measures on the highway network in 2041.

Network performance

8.4.551 Table 8-253 summarises the performance of the network in 2041 without the Proposed Scheme (future baseline) and with Proposed Scheme but not including any highway mitigation as well as with Proposed Scheme and with the proposed mitigation to address the additional trips for the AM peak hour.

Table 8-253: Birmingham Interchange area VISSIM model 2041 AM peak hour network performance indicators - future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

Parameter	AM peak (08:00-09:00)		
	Future baseline	Proposed Scheme (no mitigation)	Proposed Scheme (with mitigation)
Average delay time per vehicle [s], All Vehicle Types	144.0	275.4	127.7
Average number of stops per vehicles, All Vehicle Types	3	8	3
Average speed [mph], All Vehicle Types	31.2	23.4	33.0
Average stopped delay per vehicle [s], All Vehicle Types	25	71	23
Total delay time [h], All Vehicle Types	1576	3061	1494
Total Distance Travelled [km], All Vehicle Types	226483	224614	254358
Number of Stops, All Vehicle Types	122700	327707	114300
Number of vehicles in the network, All Vehicle Types	4977	7389	5185
Number of vehicles that have left the network, All Vehicle Types	34421	32623	36938
Total stopped delay [h], All Vehicle Types	278	784	270
Total travel time [h], All Vehicle Types	4513	5972	4790
Unreleased Vehicles	1921	5560	1867

8.4.552 Table 8-253 shows that with the mitigation in place, the overall performance of the network is substantially improved with average delays, average vehicle speeds and the number of unreleased vehicles all better than 2041 future baseline conditions. The total throughput of the network increases by 5.3% and the proportion of unreleased vehicles reduces from 4.9% in the future baseline to 4.4% with Proposed Scheme (with mitigation). Table 8-254 summarises the locations at which vehicles are unreleased in 2041 future baseline and with Proposed Scheme (no mitigation) scenarios in the AM peak hour.

Table 8-254: Birmingham Interchange area VISSIM model AM peak hour unreleased vehicles - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

AM peak (08:00-09:00)	2041 future baseline		2041 with Proposed Scheme (no mitigation)		2041 with Proposed Scheme (with mitigation)	
	Unreleased Vehicles	Proportion of Demand	Unreleased Vehicles	Proportion of Demand	Unreleased Vehicles	Proportion of Demand
A45 Coventry Rd west of Damson Parkway (EB)	617	23.90%	849	30.90%	491	17.85%
M6 east	609	12.90%	775	16.20%	367	7.67%
Stonebridge Rd north (SB)	69	4.10%	225	12.80%		

Chester Road north (SB)	20	1.30%	523	31.40%	402	24.20%
Chelmsley Road		0.00%				
M42 north (SB)	610	9.10%	1829	27.10%	575	8.52%
Damson Parkway			131	14.40%		
Catherine De Barnes Lane			1	0.10%	1	0.13%
M42 south (NB)			1172	16.00%		
M6 west			141	3.50%	79	1.97%

8.4.553 Table 8-254 shows the proposed mitigation substantially reduces the impact of unreleased vehicles.

8.4.554 Table 8-255 summarises the performance of the network for the PM peak hour.

Table 8-255: Birmingham Interchange area VISSIM model PM peak hour network performance indicators - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

Parameter	**PM peak**		
	Future baseline	**Proposed Scheme (no mitigation)**	**2041 with Proposed Scheme (with mitigation)**
Average delay time per vehicle [s], All Vehicle Types	162.3	470.8	113.2
Average number of stops per vehicles, All Vehicle Types	4.5	14.0	2.5
Average speed [mph], All Vehicle Types	30.4	15.7	34.1
Average stopped delay per vehicle [s], All Vehicle Types	37	229	20
Total delay time [h], All Vehicle Types	1955	5486	1490
Total Distance Travelled [km], All Vehicle Types	251987	202234	279202
Number of Stops, All Vehicle Types	195243	586993	118179
Number of vehicles in the network, All Vehicle Types	5880	11909	5369
Number of vehicles that have left the network, All Vehicle Types	37483	30447	42010
Total stopped delay [h], All Vehicle Types	449	2652	257
Total travel time [h], All Vehicle Types	5158	8088	5091
Unreleased Vehicles	3422	9442	1033

8.4.555 Table 8-255 shows that with the mitigation in place, the overall performance of the network is substantially improved with average delays, average vehicle speeds and the number of unreleased vehicles all better than 2041 future baseline conditions. The total throughput of the network increases by 11.9% and the proportion of unreleased vehicles reduces from 7.9% in the future baseline to 2.2% with Proposed Scheme (with mitigation). Table 8-256 summarises the locations at which vehicles are unreleased in 2041 future baseline and with Proposed Scheme (no mitigation) scenarios in the PM peak hour.

Table 8-256: Birmingham Interchange area VISSIM model PM peak hour unreleased vehicles - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

PM peak (17:00-18:00)	2041 future baseline		2041 with Proposed Scheme (no mitigation)		2041 with Proposed Scheme (with mitigation)	
	Unreleased vehicles	Proportion of demand	Unreleased vehicles	Proportion of demand	Unreleased vehicles	Proportion of demand
A45 Coventry Rd west of Damson Parkway (EB)	159	6.00%	318	11.90%	209	7.84%
Damson Parkway	183	21.80%	245	28.90%		
Terminal Road	18	5.20%	25	7.40%		
M42 south (NB)	1698	22.70%	2184	29.00%		
A452 Kenilworth Road (NB)	1	0.10%	365	28.20%		
A45 Birmingham Rd east (WB)	298	9.60%	828	26.40%		
Solihull Parkway	172	9.90%	394	22.60%	368	21.15%
Station Link Road	52	4.30%	470	39.30%	233	19.48%
Motorcycle Museum Exit	111	93.70%	55	46.20%		
M6 east	248	5.70%	863	19.70%		
M42 north (SB)	579	8.40%	1874	27.20%	223	3.23%
Catherine De Barnes			1	0.20%	1	0.16%
Starlet Way			320	73.40%		
Elmdon Trading Estate			78	34.10%		
Airport Way (Car Park)			472	51.10%		
Viking Way (Car Park)			83	47.20%		
Meriden Way			82	13.60%		
Comets End Lane			41	19.20%		
Hampton Lane			112	20.40%		
Chester Road north (SB)			114	11.20%		
Chelmsley Road			48	18.00%		

PM peak (17:00-18:00)	2041 future baseline		2041 with Proposed Scheme (no mitigation)		2041 with Proposed Scheme (with mitigation)	
	Unreleased vehicles	Proportion of demand	Unreleased vehicles	Proportion of demand	Unreleased vehicles	Proportion of demand
Coleshill Road			165	38.00%		
Bickenhill Road			49	19.40%		
Proposed Scheme Station Interchange			296	16.80%		
Yorkminster Drive			31	11.30%		
Harbet Drive			75	59.80%		
Perimeter Rd			88	44.50%		

8.4.556 Table 8-256 shows the proposed mitigation substantially reduces the impact of unreleased vehicles. The benefits to the strategic network are seen with the substantial improvements in throughput in the motorway approaches.

Junction performance 2041

M42 junction 6

8.4.557 Table 8-257 below shows the flow and maximum queues at M42 junction 6 in the weekday AM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-257: M42 junction 6 AM peak hour queue lengths (metres) - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

M42 junction 6	AM peak (08:00-09:00)					
	2041 future baseline		2041 with Proposed Scheme (no mitigation)		2041 with Proposed Scheme (with mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue	Flow (veh)	Max queue
M42 north off-slip	1680	94	1046	4901	1747	131
A45 Coventry Road east off-slip	1537	506	1675	571	1609	45
National Motorcycle Museum*	n/a	n/a	n/a	n/a	n/a	n/a
M42 south off-slip	2449	1728	2334	2388	3178	181
A45 Coventry Road west off-slip	1712	97	1534	500	1567	81
south Way - Left Turn	485	46	319	259	583	82
south Way - Ahead		58		266		87

8.4.558 Table 8-258 below shows the flow and maximum queues at M42 junction 6 in the weekday PM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-258: M42 junction 6 PM peak hour queue lengths (metres) - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

M42 junction 6	PM peak (17:00-18:00)					
	2041 future baseline		2041 with Proposed Scheme (no mitigation)		2041 with Proposed Scheme (with mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue	Flow (veh)	Max queue
M42 north off-slip	1754	3436	1282	4900	1884	208
A45 Coventry Road east off-slip	2073	1518	1144	4009	2733	182
National Motorcycle Museum*	n/a	n/a	n/a	n/a	n/a	n/a
M42 south off-slip	1713	3083	1556	3041	2634	179
A45 Coventry Road west off-slip	2465	153	1883	2368	2893	287
south Way - Left Turn	564	173	310	2079	1046	70
south Way - Ahead		181		2087		77

8.4.559 Table 8-257 Table 8-258 above show that the proposed mitigation provides substantial benefits with maximum queues reduced. In the future baseline queues were forecast to extend back to the mainline of the M42. The proposed mitigation reduces all queues to within the available off-slip capacity.

8.4.560 Table 8-259 below considers the operation of M42 junction 6 in terms of average journey times/delays and junction throughput the weekday AM peak hour.

Table 8-259: M42 junction 6 AM peak hour average journey times (seconds) and throughput - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

M42 junction 6	AM peak (08:00-09:00)		
	2041 future baseline	2041 with Proposed Scheme (no mitigation)	2041 with Proposed Scheme (with mitigation)
junction Throughput (vehicles)	7864	6908	8685
Average Travel Time per Vehicle (seconds)	126	139	83

8.4.561 Table 8-260 below shows the operation of M42 junction 6 in terms of average journey times/delays and junction throughput the weekday PM peak hour.

Table 8-260: M42 junction 6 PM peak hour average journey times (seconds) and throughput - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

M42 junction 6	PM peak		
	2041 future baseline	2041 with Proposed Scheme (no mitigation)	2041 with Proposed Scheme (with mitigation)
junction Throughput (vehicles)	8569	6175	11190
Average Travel Time per Vehicle (seconds)	165	266	97

8.4.562 Table 8-259 and Table 8-260 above show that the proposed mitigation provides an improvement in both the AM and PM peak hours. Both average journey times improve and junction throughput increases by almost 11% in the AM peak hour and 31% in the PM peak hour compared to the future baseline.

M6 junction 4

8.4.563 Table 8-261 below shows the flow and maximum queues at M6 junction 4 in the weekday AM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-261: M6 junction 4 AM peak hour queue lengths (metres) - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

M6 junction 4	AM peak (08:00-09:00)					
	2041 future baseline		2041 with Proposed Scheme (no mitigation)		2041 with Proposed Scheme (with mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue	Flow (veh)	Max queue
A446 Stonebridge Road (north)	1130	382	1064	381	1566	216
M6 east off-slip	639	139	668	1428	760	139
A446 Stonebridge Road (south)	1341	38	1050	30	1282	86
M6 west off-slip	1473	965	1708	189	1652	114

8.4.564 Table 8-262 below shows the flow and maximum queues at M6 junction 4 in the weekday PM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-262: M6 junction 4 PM peak hour queue lengths (metres) - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

M6 junction 4	PM peak (17:00-18:00)					
	2041 future baseline		2041 with Proposed Scheme (no mitigation)		2041 with Proposed Scheme (with mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue	Flow (veh)	Max queue
A446 Stonebridge Road (north)	1322	112	1474	321	1346	110
M6 east off-slip	538	73	349	53	589	105
A446 Stonebridge Road (south)	1982	184	1646	240	2792	351
M6 west off-slip	1210	1119	1380	841	1408	88

8.4.565 Table 8-261 and Table 8-262 above show that the proposed mitigation provides substantial improvements to the operation of the junction in both the AM and PM peak hours and are generally better than the future baseline.

8.4.566 Table 8-263 below considers the operation of M6 junction 4 in terms of average journey times/delays and junction throughput the weekday AM peak hour.

Table 8-263: M6 junction 4 AM peak hour average journey times (seconds) and throughput - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

M6 junction 4	AM peak		
	2041 future baseline	2041 with Proposed Scheme (no mitigation)	2041 with Proposed Scheme (with mitigation)
junction Throughput (vehicles)	4583	4489	5260
Average Travel Time per Vehicle (seconds)	66	47	57

8.4.567 Table 8-264 below shows the operation of M6 junction 4 in terms of average journey times/delays and junction throughput the weekday PM peak hour.

Table 8-264: M6 junction 4 PM peak hour average journey times (seconds) and throughput - 2026 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

M6 junction 4	PM peak		
	2026 future baseline	2026 with Proposed Scheme (no mitigation)	2041 with Proposed Scheme (with mitigation)
junction Throughput (vehicles)	5052	4850	6135
Average Travel Time per Vehicle (seconds)	59	52	46

8.4.568 Table 8-263 and Table 8-264 above show that the proposed mitigation substantially improve journey times and junction throughput. Throughput in the AM peak hour is increased by 15% and in the PM peak by around 21% when compared to the future baseline.

Stonebridge Island

8.4.569 Table 8-265 below shows the flow and maximum queues at Stonebridge Island in the weekday AM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-265: Stonebridge Island AM peak hour queue lengths (metres) - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

Stonebridge Island	AM peak (08:00-09:00)					
	2041 future baseline		2041 with Proposed Scheme (no mitigation)		2041 with Proposed Scheme (with mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue	Flow (veh)	Max queue
A452 Chester Road	2091	350	2563	473	2651	110
A45 east off-slip	299	158	292	686	936	148
A452 Kenilworth Road	1381	91	1568	791	1163	132
A45 west off-slip - left turn	1467	377	1337	1523	2543	0
A45 west off-slip - ahead		376		1522		126

8.4.570 Table 8-266 below shows the flow and maximum queues at Stonebridge Island in the weekday PM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-266: Stonebridge Island PM peak hour queue lengths (metres) - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

Stonebridge Island	PM peak (17:00-18:00)					
	2041 future baseline		2041 with Proposed Scheme (no mitigation)		2041 with Proposed Scheme (with mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue	Flow (veh)	Max queue
A452 Chester Road	2440	476	1649	3396	3762	144
A45 east off-slip	319	83	201	2531	768	73
A452 Kenilworth Road	1274	149	597	1853	1059	119
A45 west off-slip - left turn	1201	218	1207	474	1295	0
A45 west off-slip - ahead		212		470		62

8.4.571 Table 8-265 and Table 8-266 above show that the proposed mitigation measures substantially reduce queues at the junction in both the AM and PM peak hours with no queues extending back and impacting on the mainline of the A45 Coventry Road.

8.4.572 Table 8-267 below considers the operation of Stonebridge Island in terms of average journey times/delays and junction throughput the weekday AM peak hour.

Table 8-267: Stonebridge Island AM peak hour average journey times (seconds) and throughput - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

Stonebridge Island	AM peak		
	2041 future baseline	2041 with Proposed Scheme (no mitigation)	2041 with Proposed Scheme (with mitigation)
junction Throughput (vehicles)	5237	5760	7293
Average Travel Time per Vehicle (seconds)	69	116	63

8.4.573 Table 8-268 below shows the operation of Stonebridge Island in terms of average journey times/delays and junction throughput the weekday PM peak hour.

Table 8-268: Stonebridge Island PM peak hour average journey times (seconds) and throughput - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

Stonebridge Island	PM peak (17:00-18:00)		
	2041 future baseline	2041 with Proposed Scheme (no mitigation)	2041 with Proposed Scheme (with mitigation)
junction Throughput (vehicles)	5233	3655	6884
Average Travel Time per Vehicle (seconds)	57	141	60

8.4.574 Table 8-267 and Table 8-268 above show that the proposed mitigation substantially improves throughput with minimal impact on journey times. Throughput in the AM peak hour is increased by 39% and in the PM peak by around 32%.

A45 Coventry Road/Damson Parkway

8.4.575 Table 8-269 below shows the flow and maximum queues at the A45 Coventry Road/Damson Parkway traffic signal junction in the weekday AM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-269: A45 Coventry Road/Damson Parkway AM peak hour queue lengths (metres) - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

A45 Coventry Road/Damson Parkway	AM peak (08:00-09:00)					
	2041 future baseline		2041 with Proposed Scheme (no mitigation)		2041 with Proposed Scheme (with mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue	Flow (veh)	Max queue
Terminal Road - Left Turn	221	141	225	143	233	67
Terminal Road - Ahead/ Right Turn		143		145		66
A45 Coventry Road (east) - Ahead	2299	178	2101	200	2380	104
A45 Coventry Road (east) - Right Turn		62		50		70
Damson Parkway - Left Turn	757	37	755	32	902	38
Damson Parkway - Ahead/Right Turn		492		645		462
A45 Coventry Road (west) - Ahead	1966	1003	1953	1002	2211	1002
A45 Coventry Road (west) - Right Turn		64		63		91

8.4.576 Table 8-270 below shows the flow and maximum queues at in the weekday PM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-270: A45 Coventry Road/Damson Parkway PM peak hour queue lengths (metres) - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

A45 Coventry Road/Damson Parkway	PM peak (17:00-18:00)					
	2041 future baseline		2041 with Proposed Scheme (no mitigation)		2041 with Proposed Scheme (with mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue	Flow (veh)	Max queue
Terminal Road - Left Turn	265	193	257	196	339	70
Terminal Road - Ahead/ Right Turn		194		197		72
A45 Coventry Road (east) - Ahead	2831	385	2142	531	3360	167
A45 Coventry Road (east) - Right Turn		72		63		52
Damson Parkway - Left Turn	641	164	605	41	845	34

Damson Parkway - Ahead/Right Turn		645		644		405
A45 Coventry Road (west) - Ahead	2391	1001	2285	1000	2349	1005
A45 Coventry Road (west) - Right Turn		520		649		273

8.4.577 Table 8-269 and Table 8-270 above show that the proposed mitigation results in overall queues of a similar magnitude in both the AM and PM peak hours to the future baseline but that throughput improves substantially.

8.4.578 Table 8-271 below considers the operation of the A45 Coventry Road/Damson Parkway traffic signal junction in terms of average journey times/delays and junction throughput the weekday AM peak hour.

Table 8-271: A45 Coventry Road/Damson Parkway AM peak hour average journey times (seconds) and throughput - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

A45 Coventry Road/Damson Parkway	**AM peak (08:00-09:00)**		
	2041 future baseline	**2041 with Proposed Scheme (no mitigation)**	**2041 with Proposed Scheme (with mitigation)**
junction Throughput (vehicles)	5243	5034	5726
Average Travel Time per Vehicle (seconds)	76	87	64

8.4.579 Table 8-272 below shows the operation of the A45 Coventry Road/Damson Parkway traffic signal junction in terms of average journey times/delays and junction throughput the weekday PM peak hour.

Table 8-272: A45 Coventry Road/Damson Parkway PM peak hour average journey times (seconds) and throughput - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

A45 Coventry Road/Damson Parkway	**PM peak**		
	2041 future baseline	**2041 with Proposed Scheme (no mitigation)**	**2041 with Proposed Scheme (with mitigation)**
junction Throughput (vehicles)	6129	5289	6893
Average Travel Time per Vehicle (seconds)	75	98	59

8.4.580 Table 8-271 and Table 8-272 above show that the proposed mitigation substantially improves throughput and journey times. Throughput in the AM peak hour is increased by 9% and in the PM peak by around 12% while journey times improve in both peak hours.

8.4.581 The following sections consider the knock-on impact on the other main junctions in the network as well as route travel times in 2041.

A452 Chester Road/B4438 Bickenhill Parkway

8.4.582 Table 8-273 below shows the flow and maximum queues at the A452 Chester Road/B4438 Bickenhill Parkway roundabout junction (Birmingham Business Park) in the weekday AM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-273: A452 Chester Road/B4438 Bickenhill Parkway AM peak hour queue lengths (metres) - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

A452 Chester Road/B4438 Bickenhill Parkway	AM peak (08:00-09:00)					
	2041 future baseline		2041 with Proposed Scheme (no mitigation)		2041 with Proposed Scheme (with mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue	Flow (veh)	Max queue
A446 north slips	927	114	n/a	n/a	n/a	n/a
A452 Chester Road south	830	173	n/a	n/a	n/a	n/a
B4438 Bickenhill Parkway	349	190	349	51	349	95
Solihull Parkway	163	13	163	10	163	25
A452 Chester Road north	1264	30	1264	13	1264	3

8.4.583 Table 8-274 below shows the flow and maximum queues at in the weekday PM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-274: A452 Chester Road/B4438 Bickenhill Parkway PM peak hour queue lengths (metres) - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

A452 Chester Road/B4438 Bickenhill Parkway	PM peak (17:00-18:00)					
	2041 future baseline		2041 with Proposed Scheme (no mitigation)		2041 with Proposed Scheme (with mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue	Flow (veh)	Max queue
A446 north slips	170	32	n/a	n/a	n/a	n/a
A452 Chester Road south	621	67	n/a	n/a	n/a	n/a
B4438 Bickenhill Parkway	487	25	317	134	449	86
Solihull Parkway	1529	246	1408	191	1282	192
A452 Chester Road north	1001	1051	695	188	1120	334

8.4.584 Table 8-273 and Table 8-274 above show the proposed mitigation has no substantial impacts on the junction compared to the future baseline in both the AM and PM peak hours.

8.4.585 As noted above the existing roundabout junction is replaced by a series of three roundabout junctions and associated link roads. Table 8-275 and Table 8-276 summarise the queue results for the two further new junctions which are not included in the tables above.

Table 8-275: B4438 Bickenhill Parkway/Northway peak hour queue lengths (metres) - 2041 with Proposed Scheme (with mitigation)

B4438 Bickenhill Parkway/Northway roundabout	AM peak (08:00-09:00)	PM peak (17:00-18:00)
	Max queue	Max queue
B4438 (north)	84	51
New Link from Interchange Roundabout	177	15

B4438 Bickenhill Parkway/Northway roundabout	AM peak (08:00-09:00)	PM peak (17:00-18:00)
	Max queue	Max queue
Northway	116	45
B4438 (south)	101	37

Table 8-276: New Proposed Scheme Birmingham Interchange Access/A446 Links/A452 Links peak hour queue lengths (metres) - 2041 with Proposed Scheme (with mitigation)

Proposed Scheme Birmingham Interchange Access roundabout	AM peak (08:00-09:00)	PM peak (17:00-18:00)
	Max queue	Max queue
A446 Link Road (north)	79	51
A452 Link Road (south)	200	0
Proposed Scheme Egress 1	17	3
Proposed Scheme Egress 2	7	11
A452 Link Road (north)	9	80

8.4.586 Table 8-275 and Table 8-276 above show that the new roundabout junctions operate with little or no queue related problems.

8.4.587 The table below considers the operation of the network of three junctions compared with the existing A452 Chester Road/B4438 Bickenhill Parkway roundabout junction in terms of average journey times/delays and junction throughput the weekday AM peak hour.

Table 8-277: A452 Chester Road/B4438 Bickenhill Parkway AM peak hour average journey times (seconds) and throughput - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

A452 Chester Road/B4438 Bickenhill Parkway	AM peak		
	2041 future baseline	2041 with Proposed Scheme (no mitigation)	2041 with Proposed Scheme (with mitigation)
junction Throughput (vehicles)	3998	4624	5640
Average Travel Time per Vehicle (seconds)	75	108	98

8.4.588 Table 8-278 below shows the operation of the network of three junctions compared with the existing A452 Chester Road/B4438 Bickenhill Parkway roundabout junction in terms of average journey times/delays and junction throughput the weekday PM peak hour.

Table 8-278: A452 Chester Road/B4438 Bickenhill Parkway PM peak hour average journey times (seconds) and throughput - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

A452 Chester Road/B4438 Bickenhill Parkway	PM peak		
	2041 future baseline	2041 with Proposed Scheme (no mitigation)	2041 with Proposed Scheme (with mitigation)
junction Throughput (vehicles)	4123	3897	5379
Average Travel Time per Vehicle (seconds)	97	124	97

8.4.589 Table 8-278 and Table 8-277Table 8-278 above show that there is no substantial difference in average journey times through the junction. Journey times are forecast to increase by around 31% in the AM peak hour which is likely to be as a result of the longer journey distances through the network but this is associated with a 41% increase in throughput. In the PM peak, average journey times are unchanged but throughput increases by 30%.

A45 Coventry Road/B4438 Catherine-de-Barnes Lane

8.4.590 Table 8-279 below shows the flow and maximum queues at the A45 Coventry Road/B4438 Catherine-de-Barnes Lane roundabout junction in the weekday AM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-279: A45 Coventry Road/B4438 Catherine-de-Barnes Lane AM peak hour queue lengths (metres) - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

A45 Coventry Road/B4438 Catherine-de-Barnes Lane	AM peak (08:00-09:00)					
	2041 future baseline		2041 with Proposed Scheme (no mitigation)		2041 with Proposed Scheme (with mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue	Flow (veh)	Max queue
B4438 Bickenhill Lane	1155	57	1225	33	1133	29
A45 east off-slip	2774	84	2655	167	2820	120
B4438 Catherine De Barnes	783	50	782	157	780	94
A45 west off-slip	1703	17	2107	54	2043	18

8.4.591 Table 8-280 below shows the flow and maximum queues at in the weekday PM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-280: A45 Coventry Road/B4438 Catherine-de-Barnes Lane PM Peak Hour Queue Lengths (metres - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

A45 Coventry Road/B4438 Catherine-de-Barnes Lane	PM peak (17:00-18:00)					
	2041 future baseline		2041 with Proposed Scheme (no mitigation)		2041 with Proposed Scheme (with mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue	Flow (veh)	Max queue
B4438 Bickenhill Lane	2425	12	1563	215	2424	48
A45 east off-slip	2419	194	1833	64	2767	69

A45 Coventry Road/B4438 Catherine-de-Barnes Lane	PM peak (17:00-18:00)					
	2041 future baseline		2041 with Proposed Scheme (no mitigation)		2041 with Proposed Scheme (with mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue	Flow (veh)	Max queue
B4438 Catherine De Barnes	618	73	597	109	625	48
A45 west off-slip	1939	56	1743	18	2140	15

8.4.592 Table 8-279 Table 8-280 above show that in both the AM and PM peak hours the proposed mitigation has minimal impact on the performance of the junction when compared to the future baseline with only transient queues.

8.4.593 Table 8-281 below considers the operation of the A45 Coventry Road/B4438 Catherine-de-Barnes Lane roundabout junction in terms of average journey times/delays and junction throughput the weekday AM peak hour.

Table 8-281: A45 Coventry Road/B4438 Catherine-de-Barnes Lane AM peak hour average journey times (seconds) and throughput - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

A45 Coventry Road/B4438 Catherine-de-Barnes Lane	AM peak (08:00-09:00)		
	2041 future baseline	2041 with Proposed Scheme (no mitigation)	2041 with Proposed Scheme (with mitigation)
junction Throughput (vehicles)	6415	6769	6777
Average Travel Time per Vehicle (seconds)	23	25	24

8.4.594 Table 8-282 below shows the operation of the A452 Chester Road/B4438 Bickenhill Parkway roundabout junction in terms of average journey times/delays and junction throughput the weekday PM peak hour.

Table 8-282: A45 Coventry Road/B4438 Catherine-de-Barnes Lane PM peak hour average journey times (seconds) and throughput - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

A45 Coventry Road/B4438 Catherine-de-Barnes Lane	PM peak (17:00-18:00)		
	2041 future baseline	2041 with Proposed Scheme (no mitigation)	2041 with Proposed Scheme (with mitigation)
junction Throughput (vehicles)	7401	5736	7659
Average Travel Time per Vehicle (seconds)	23	63	23

8.4.595 Table 8-281 and Table 8-282 above show that with the proposed mitigation the junction operates at a similar level of performance as the future baseline.

A452 Chester Road/Coleshill Heath Road roundabout

8.4.596 Table 8-283 below shows the flow and maximum queues at the A452 Chester Road/Coleshill Heath Road roundabout in the weekday AM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-283: A452 Chester Road/Coleshill Heath Road roundabout AM peak hour queue lengths (metres) - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

A452 Chester Road/Coleshill Heath Road	AM peak (08:00-09:00)					
	2041 future baseline		2041 with Proposed Scheme (no mitigation)		2041 with Proposed Scheme (with mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue	Flow (veh)	Max queue
Coleshill Heath Road (north)	425	974	679	1325	637	1270
Chester Road (east)	818	36	615	26	1041	46
Coleshill Heath Road (south)	570	103	712	156	489	190
Chester Road (west)	1300	1294	1007	1299	1104	1325

8.4.597 Table 8-284 below shows the flow and maximum queues at in the weekday PM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-284: A452 Chester Road/Coleshill Heath Road PM peak hour queue lengths (metres) - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

A452 Chester Road/Coleshill Heath Road	PM peak (17:00-18:00)					
	2041 future baseline		2041 with Proposed Scheme (no mitigation)		2041 with Proposed Scheme (with mitigation)	
	Flow (veh)	Max queue	Flow (veh)	Max queue	Flow (veh)	Max queue
Coleshill Heath Road (north)	778	594	847	1256	855	1082
A452 Chester Road (east)	1504	356	1006	1353	1610	722
Coleshill Heath Road (south)	368	199	430	807	418	338
A452 Chester Road (west)	1002	151	878	66	1012	257

8.4.598 As in 2026, Table 8-283 and Table 8-284 above show that queues are forecast to increase in both the AM and PM peak hours. In the PM peak hour, the queues with mitigation are forecast to reduce against the without mitigation but remain longer than the future baseline. As explained earlier, this is associated with traffic re-routing due to a combination of wider network congestion and existing A452 Chester Road/B4438 Bickenhill Parkway roundabout being replaced by the three new junctions which increase journey distances on alternative routes. As a result, the model indicates that some traffic will reroute via Coleshill Heath Road and thereby having an impact on the A452 Chester Road/Coleshill Heath Road roundabout.

8.4.599 Table 8-285 below considers the operation of A452 Chester Road/Coleshill Heath Road roundabout junction in terms of average journey times/delays and junction throughput the weekday AM peak hour.

Table 8-285: A452 Chester Road/Coleshill Heath Road AM peak hour average journey times (seconds) and throughput - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

A452 Chester Road/Coleshill Heath Road	AM peak		
	2041 future baseline	2041 with Proposed Scheme (no mitigation)	2041 with Proposed Scheme (with mitigation)
junction Throughput (vehicles)	3113	3013	3271
Average Travel Time per Vehicle (seconds)	145	172	137

8.4.600 Table 8-286 below shows the operation of the A452 Chester Road/Coleshill Heath Road roundabout junction in terms of average journey times/delays and junction throughput the weekday PM peak hour.

Table 8-286: A452 Chester Road/Coleshill Heath Road PM peak hour average journey times (seconds) and throughput - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

A452 Chester Road/Coleshill Heath Road	PM peak		
	2041 future baseline	2041 with Proposed Scheme (no mitigation)	2041 with Proposed Scheme (with mitigation)
junction Throughput (vehicles)	3652	3161	3894
Average Travel Time per Vehicle (seconds)	49	85	70

8.4.601 Table 8-285 and Table 8-286 above show that average journey times through the junction are not substantially affected by the Proposed Scheme and throughput increases. Overall, whilst queues are longer the junction continues to junction at similar levels to the future baseline.

Route travel times 2026

M42 junction 6-J7

8.4.602 Table 8-287 below summarises the change in journey times on the M42 in the weekday AM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-287: M42 travel time AM peak hour (seconds) - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

AM peak	2041 future baseline	2041 with Proposed Scheme (no mitigation)	2041 with Proposed Scheme (with mitigation)
northbound	319	370	310
southbound	327	385	319

8.4.603 Table 8-288 below summarises the change in journey times on the M42 in the weekday PM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-288: M42 travel time PM peak hour (seconds) - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

PM peak	2041 future baseline	2041 with Proposed Scheme (no mitigation)	2041 with Proposed Scheme (with mitigation)
northbound	426	472	462
southbound	346	443	329

8.4.604 Table 8-287 and Table 8-288 above show that with the proposed mitigation travel times on the M42 similar to the future baseline in both the AM and PM peak hours.

A45 Coventry Road between Goodway Road and Shepherds Lane

8.4.605 Table 8-289 below summarises the change in journey times on the A45 Coventry Road in the weekday AM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-289: A45 Coventry Road travel time AM peak hour (seconds) - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

AM peak	2041 future baseline	2041 with Proposed Scheme (no mitigation)	2041 with Proposed Scheme (with mitigation)
eastbound	486	571	456
westbound	379	386	364

8.4.606 Table 8-290 below summarises the change in journey times on the A45 Coventry Road in the weekday PM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-290: A45 Coventry Road travel time PM peak hour (seconds) - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

PM peak	2041 future baseline	2041 with Proposed Scheme (no mitigation)	2041 with Proposed Scheme (with mitigation)
eastbound	421	635	452
westbound	465	773	392

8.4.607 Table 8-289 and Table 8-290 above show that with the proposed mitigation, average journey times on the A45 Coventry Road are a similar to the future baseline.

A446 between Stonebridge Island and A446 Stonebridge Road/B4117 Coventry Road junction

8.4.608 Table 8-291 below summarises the change in journey times on the A446 in the weekday AM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-291: A446 Coventry Road travel time AM peak hour (seconds) - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

AM peak	2041 future baseline	2041 with Proposed Scheme (no mitigation)	2041 with Proposed Scheme (with mitigation)
northbound	228	254	260
southbound	552	511	300

8.4.609 Table 8-291 below summarises the change in journey times on the A446 in the weekday PM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-292: A446 travel time PM peak hour (seconds) - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

PM peak	2041 future baseline	2041 with Proposed Scheme (no mitigation)	2041 with Proposed Scheme (with mitigation)
northbound	234	257	284
southbound	271	877	261

8.4.610 Table 8-291 and Table 8-292 above show that the proposed mitigation improves travel times in the southbound direction in the AM peak hour. In overall terms, travel times at not substantially different to the future baseline.

A452 between Cornet's End Roundabout and A452 Chester Road/Coleshill Heath Road Roundabout

8.4.611 Table 8-293 below summarises the change in journey times on the A452 in the weekday AM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-293: A452 travel time AM peak hour (seconds) - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

AM peak	2041 future baseline	2041 with Proposed Scheme (no mitigation)	2041 with Proposed Scheme (with mitigation)
northbound	332	501	408
southbound	359	372	323

8.4.612 Table 8-294 below summarises the change in journey times on the A452 in the weekday PM peak hour. Results have been extracted from the validated and future years VISSIM models.

Table 8-294: A452 travel time PM peak hour (seconds) - 2041 future baseline (no Proposed Scheme) vs Hs2 (no mitigation) vs Proposed Scheme (with mitigation)

PM peak	2041 future baseline	2041 with Proposed Scheme (no mitigation)	2041 with Proposed Scheme (with mitigation)
northbound	318	588	486
southbound	483	1022	340

8.4.613 Table 8-293 and Table 8-294 above show that northbound travel times are increased compared to the future baseline. This is likely to be as a result of the improved throughput of the network and longer distances associated with the new three junction arrangements which replace the A452 Chester Road/B4338 Bickenhill Parkway junction.

Highway network summary

8.4.614 The analysis of the highway network undertaken above clearly shows that the proposed mitigation measures ensure than the network performs at or better than conditions in the future baseline in 2026 and 2041. Queues and delays at the key junctions on the routes into Proposed Scheme are substantially reduced and this provides substantial benefits to the conditions on the wider network.

Accidents and safety

8.4.615 The proposed mitigation will be subject to full safety audit to ensure that any implementation of the measures does not raise any new safety issues.

Parking

8.4.616 The loss of spaces at the National Motorcycle Museum is associated with the construction of the capacity improvements to M42 junction 6. It is not expected that the impact of the loss would be substantial as there is a substantial amount of car parking at the National Motorcycle Museum. Also, the estimated loss is expected to be an over-estimate and detailed phasing of the works including could potentially reduce the loss of spaces and/or the duration over which spaces are lost. The relocation of the National Motorcycle Museum access could also release land in which spaces could be reprovided.

8.4.617 It is estimated that there will be a temporary loss of approximately 55 car parking spaces during construction. The mitigation may also have an impact of up to 80 spaces on completion of the Proposed Scheme however it is expected that at least some of the spaces could be re-provided within the site which would minimise any impact.

8.4.618 HS2 Ltd will continue to work with the businesses affected to identify opportunities where reasonably practical to mitigate the impacts on parking.

Rail

8.4.619 The proposed mitigation will have no substantial detrimental impact on the strategic rail network. The improvements in the operation of the highway network will benefit users of the strategic rail network by reducing delays and improving journey times around the area including to Birmingham International Station.

Local rail services

8.4.620 As with strategic rail, the proposed mitigation will improve the overall operation of the highway network and will therefore benefit users of the local rail network by reducing delays and improving journey times around the area including to Birmingham International Station.

Local bus and coach services

8.4.621 The proposed mitigation will improve the overall operation of the highway network and will therefore benefit users of local bus and coach services by reducing delays and improving journey times around the area.

Public transport interchanges

8.4.622 The proposed mitigation will have no impact on public transport interchanges.

Taxis

8.4.623 The proposed mitigation will have no impact on taxi operations. The proposed mitigation will improve the overall operation of the highway network and will therefore benefit users of taxis by reducing delays and improving journey times around the area.

Pedestrian, cyclist and equestrian

8.4.624 The proposed mitigation works will require the relocation of the access to the National Motorcycle Museum. The access will be relocated on to the A45 service road and will require an adjustment to an existing PRoW FP M107 which will need to be diverted locally to facilitate the access. The proposed diversion for the PRoW is shown on CT-06-106-L1, Volume 2, Map Book 24 and results in the overall length of the PRoW increasing by around 30m. This will have no substantial impact on users of the PRoW.

8.4.625 The highway mitigation works will also require amendments to the footways and cycle links around M42 junction 6 and Stonebridge Island. The design of the junctions will ensure that pedestrian and cycle links are maintained.

8.4.626 The proposed mitigation works will have no impact on equestrians other than those identified for PRoW above.

Waterways and canals

8.4.627 The proposed mitigation works will have no impact on waterways and canals in this study area.

Operational impacts summary

8.4.628 Table 8-295 provides a summary of the issues by mode in the Birmingham Interchange and Chelmsley Wood area as a result of the operation of the Proposed Scheme.

Table 8-295: Operation; summary of issues

Mode	Issue	
	2026	**2041**
Highway	Increase in traffic on strategic routes through the area particularly on the M42 (south of junction 6), A45 Coventry Road (between M42 junction 6 and Stonebridge Island), the A452 Chester Road and the A446 Stonebridge Road. This increase in traffic has an impact on these three key junctions (M42 junction 6, M6 junction 4 and Stonebridge Island. Some residual impact on local roads mainly as a result of wider congestion leading to traffic re-routing via alternative routes including Coleshill Heath Road, Bickenhill Parkway and Northway. Proposed mitigation strategy of improving the three key junctions is clearly shown to mitigate the impact of the Proposed Scheme and minimise the impact on the highway network.	Increase in traffic on strategic routes through the area particularly on the M42 (south of junction 6), A45 Coventry Road (between M42 junction 6 and Stonebridge Island), the A452 Chester Road and the A446 Stonebridge Road. This increase in traffic has an impact on these three key junctions (M42 junction 6, M6 junction 4 and Stonebridge Island. Some residual impact on local roads mainly as a result of wider congestion leading to traffic re-routing via alternative routes including Coleshill Heath Road, Bickenhill Parkway and Northway. Proposed mitigation strategy of improving the three key junctions is clearly shown to mitigate the impact of the Proposed Scheme and minimise the impact on the highway network.
Public Transport	The Proposed Scheme will provide improved rail capacity and rail journey times on the rail network between the west Midlands and London. People within this area have easy access to Birmingham Interchange station and will therefore benefit from these improved rail services. No impact on local rail, bus or coach services.	The Proposed Scheme will provide improved rail capacity and rail journey times on the rail network between the west Midlands and London and cities to the north (Phase Two). People within this area have easy access to Birmingham Interchange station and will therefore benefit from these improved rail services. No impact on local rail, bus or coach services.
Pedestrian, Cyclists and Equestrians	No substantial impacts on public rights of way as all existing connections will be maintained or replaced. Users of Middle Bickenhill Lane and the existing A452 Chester Road/Bickenhill Parkway will experience increased journey distances and times due to the need to permanently close part of Middle Bickenhill Lane and replace the A452 Chester Road/Bickenhill Parkway roundabout to accommodate the proposed scheme. No impacts on cyclist or equestrians further to the highway and pedestrian impacts highlighted above.	No substantial impacts on public rights of way as all existing connections will be maintained or replaced. Users of Middle Bickenhill Lane and the existing A452 Chester Road/Bickenhill Parkway will experience increased journey distances and times due to the need to permanently close part of Middle Bickenhill Lane and replace the A452 Chester Road/Bickenhill Parkway roundabout to accommodate the proposed scheme. No impacts on cyclist or equestrians further to the highway and pedestrian impacts highlighted above.
Waterways	No impact - no navigable waterways.	No impact - no navigable waterways.
Parking	Permanent loss of parking at the NEC, west car park, Birmingham International station, Birmingham Business Park, Melbicks Garden Centre and the National Motorcycle Museum. HS2 will work with land owners and occupiers to ensure that wherever practicably possible the impacts and managed and minimised.	Permanent loss of parking at the NEC, west car park, Birmingham International station, Birmingham Business Park, Melbicks Garden Centre and the National Motorcycle Museum. HS2 will work with land owners and occupiers to ensure that wherever practicably possible the impacts and managed and minimised.
Air Transport	No impact	No impact